

1279-8.

**BLAWFORMS**  
for  
**GENERAL  
CONCRETE  
CONSTRUCTION**

SEP 29 1930



**BLAW-KNOX COMPANY**  
**PITTSBURGH, PA.**



[BLANK PAGE]



CCA



# BLAWFORMS

## FOR

### GENERAL CONCRETE CONSTRUCTION



**BLAW-KNOX COMPANY**  
**PITTSBURGH, PA.**

*Branches in Principal Cities*

EXPORT DIVISION:—MILLIKEN BROS.—BLAW-KNOX CORP., 342 Madison Ave., New York City

LONDON:—BLAW-KNOX LTD., New Oxford House, Hart St. Holborn, W.C.1, London, England

PARIS:—COMPAGNIE FRANCAISE BLAW-KNOX, 1 Rue de Clichy, Paris (IX<sup>e</sup>), Paris, France

MILANO, ITALY:—COMPAGNIA ITALIANA FORME ACCIAIO, 6 Via S. Agnese—6—Milano

*Representatives in all parts of the world*

Copyright 1939, Blaw-Knox Co.



## CONTENTS

Introductory . . . . .	Page 3
Circular Concrete Conduits . . . . .	7
Horseshoe Shaped Concrete Conduits . . . . .	13
Rectangular Concrete Conduits . . . . .	23
Concrete Tunnels . . . . .	31
Concrete Walls . . . . .	39
Standardized Wall Forms . . . . .	49
Concrete Piers . . . . .	53
Concrete Dams . . . . .	55
Subways . . . . .	59
Concrete Bridges . . . . .	65
Traffic Tubes . . . . .	75
Miscellaneous Concrete Structures . . . . .	79
Street, Curb, Gutter and Sidewalk Forms . . . . .	95
Clamshell and Dragline Buckets . . . . .	103
Standard Steel Buildings . . . . .	105
Measuring Equipment (Concrete Aggregates) . . . . .	101
Central Mixing Plants . . . . .	101
Road Finishing Machinery & Graders . . . . .	99
Road Forms . . . . .	97
Export Department . . . . .	106

10 88-134506 TCF



# INTRODUCTORY

OVER twenty-three years have elapsed since the first Blaw-Knox Steel Form pointed the way to more efficient and economical concreting. During this time over 31,000 separate contracts have been completed with the assistance of steel forms, covering a bewildering variety of concrete construction, many of which are landmarks in the field of engineering achievement.

Experience resulting from the development of steel forms for so many years and for so many varying conditions has given our engineers the exact knowledge necessary to design steel forms for any variety of concrete construction regardless of intricacy. Such forms are furnished with assurance of their complete practicability.

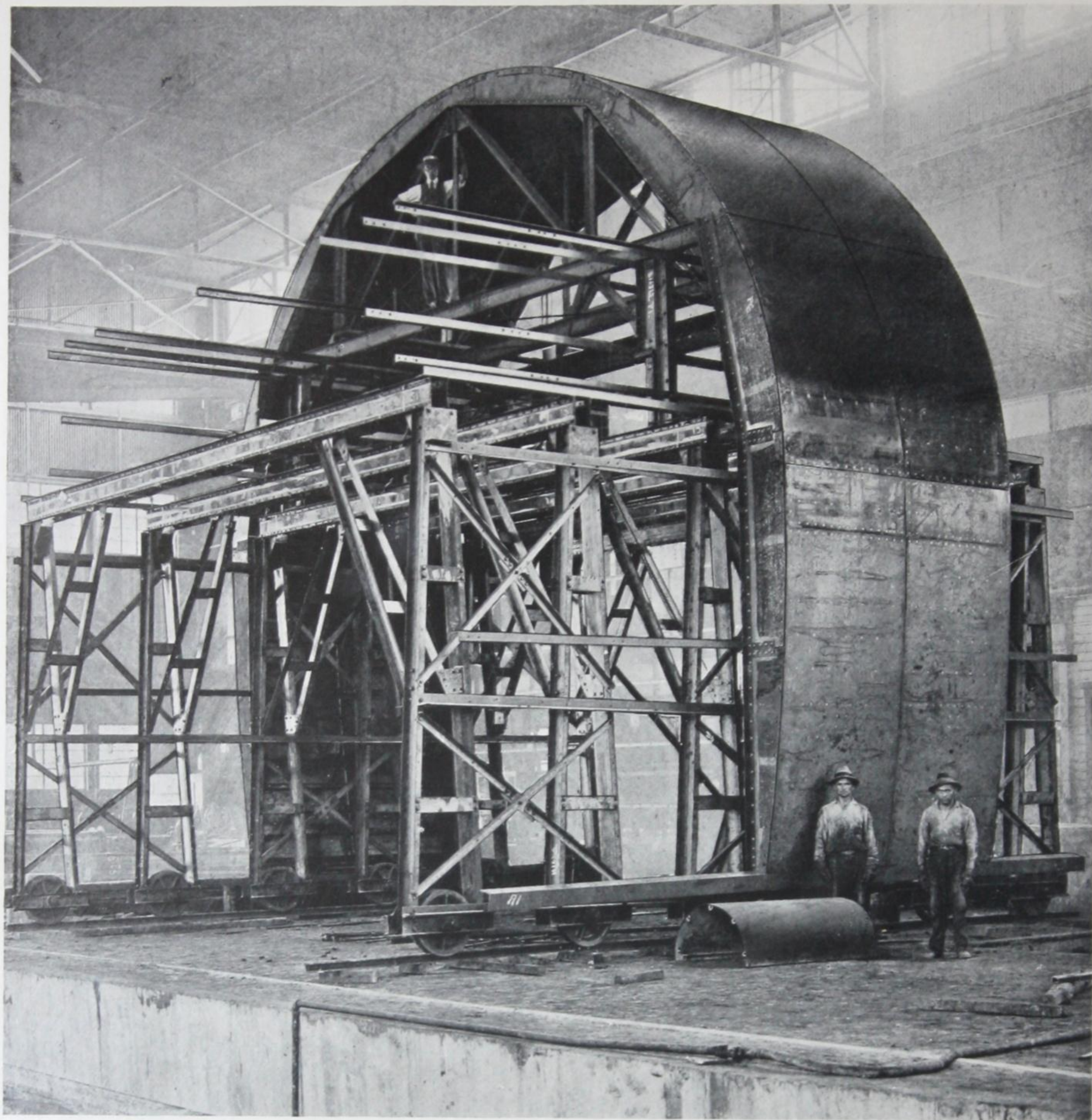
The fundamental advantages of Blaw-Knox Steel Forms are listed briefly hereafter:

1. *They will do the work in the manner intended.*
2. *Steel forms are ready for instant use when they arrive on the job.*
3. *Steel forms give an absolutely smooth surface to the job, eliminating friction loss.*
4. *Blaw-Knox Forms enable a predetermined working schedule to be followed, day in and day out.*
5. *They can be used in cold weather and heated from inside.*
6. *Common labor handles Blaw-Knox Forms efficiently.*
7. *Require no repairs or maintenance.*
8. *Steel forms are not affected by weather or climate.*
9. *Steel forms are leakproof and preserve the grout.*
10. *Blaw-Knox Forms are designed for mechanical handling, cutting labor and handling costs to a minimum.*
11. *The use of reinforcing steel will not damage steel forms in the slightest.*
12. *Steel forms can be removed from the concrete sooner than wood forms.*
13. *All form engineering is done before the forms are delivered.*
14. *Extremely low forming costs result from the use of Blaw-Knox Forms.*
15. *All steel form contracts are serviced on the job by a construction engineer who helps with the first installation of forms and their use.*

Prior to shipment all forms are erected in the testing department of the company and all characteristics are carefully checked, assuring perfect operation on the job.

Special machinery has been developed for the manufacture of Blaw-Knox





*All Blaw-Knox Steel Forms are set up, inspected and tested in the shop before shipment. Dimensions are carefully checked with drawings and again compared with detailed information from the job as to the exact service expected from the forms. All parts are inspected for fit—all moving parts of collapsible and telescopic forms are tested for maximum and minimum adjustment range. When Blaw-Knox Forms arrive on the work they are ready for service.*



Forms. This not only makes form construction extremely accurate but also economical.

Blaw-Knox Forms are used the world over by contractors, railroads, civic and national bodies and industries. They can be designed and manufactured as easily for contracts thousands of miles removed, as for jobs close by. Time limitations and freight rates do not influence materially the savings made through the use of these forms and they are found extremely economical in many countries far distant from the United States, where labor is comparatively cheap.

The consulting service extended by our Engineering Department is prized by all who have taken advantage of its facilities. This service is offered in the interests of engineering progress and is free from any charge or obligation.

It is obviously impossible to describe every variation of concrete work on which steel forms can be utilized for utmost economy and betterment. In general, however, such contracts divide themselves in the following classes:

1. *Conduits of all shapes, sizes and lengths.*
2. *Tunnels of all kinds and for any use.*
3. *Light concrete walls of all description.*
4. *Heavy concrete walls, retaining walls, railroad elevation work, etc.*
5. *Dams of the gravity type, core wall type and others.*
6. *Reinforced concrete bridges of all types.*
7. *Concrete piers, abutments, etc.*
8. *Reinforced concrete reservoirs, filtration plants, sewage disposal plants, etc.*

Among some of the noteworthy construction and engineering projects on which Blaw-Knox Steel Forms were used are the following:

PANAMA CANAL

CATSKILL AQUEDUCT

WINNIPEG AQUEDUCT

NEW YORK, PHILADELPHIA AND CINCINNATI SUBWAY SYSTEMS

OAKLAND-ALAMEDA VEHICULAR TUNNEL

HOLLAND VEHICULAR TUNNEL

ARLINGTON MEMORIAL BRIDGE

WASHINGTON-GEORGETOWN KEY BRIDGE

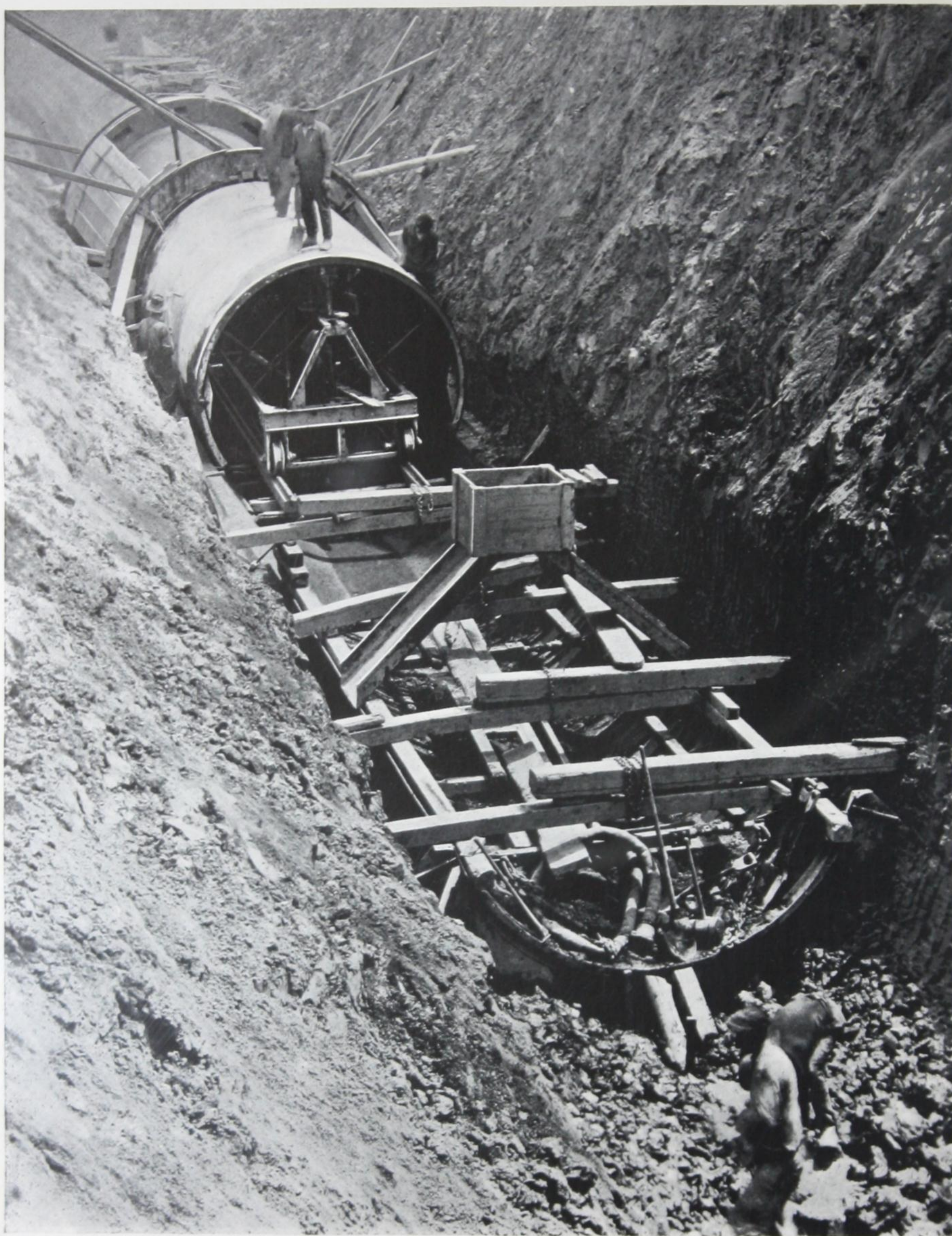
RARITAN RIVER BRIDGE

LIBERTY TUNNELS

CHICAGO SEWAGE DISPOSAL PLANTS

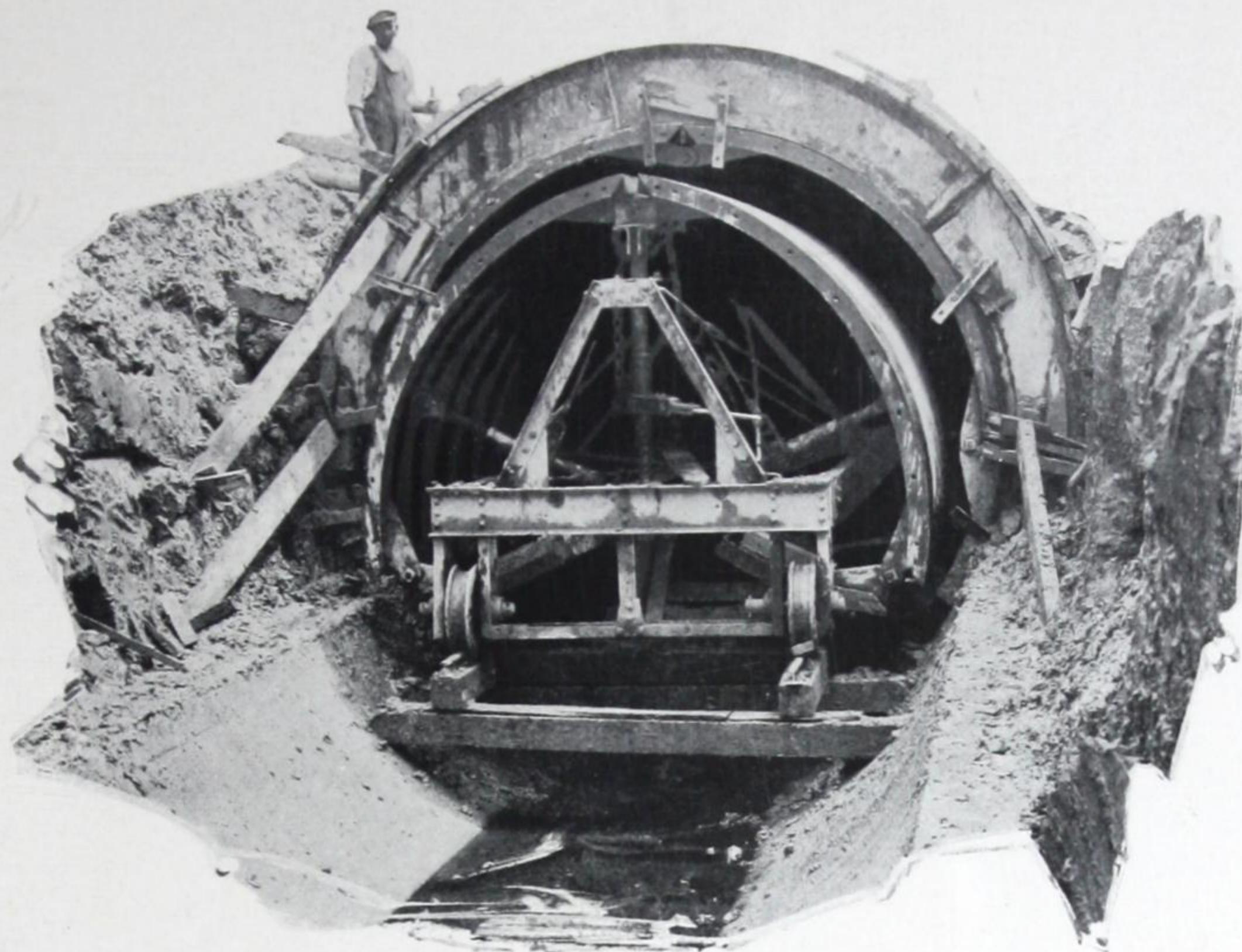
MAIN SEWAGE CONDUITS IN AMERICA'S GREATEST CITIES.





14' sewer constructed by Brandon and Hanna for City of Detroit, Mich. Note telescopic type of form used with invert poured ahead with steel form. 150 lineal feet of arch forms and one 25' traveler gave a progress of 50' per day.





## Circular Concrete Conduits

**T**HE illustrations used in this section show the different methods of forming circular conduits with the use of Blaw-Knox Steel Forms. In some instances, the top and bottom are formed separately by a half round form; others are formed by screeding in either one-third or one-fourth of the invert, then using a telescopic form for the balance of the circle; in others the entire circle is poured as a monolith.

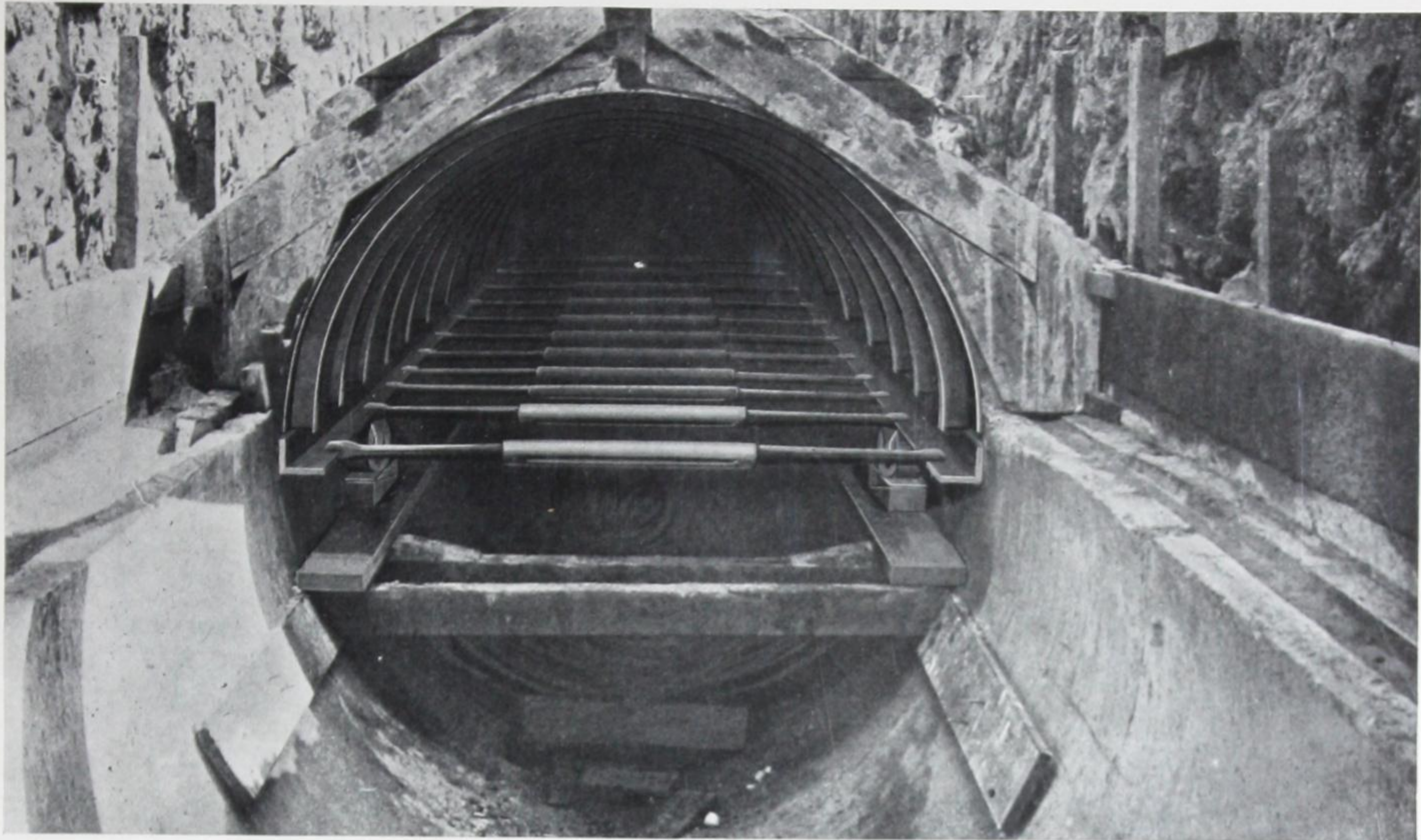
Each job is carefully studied by Blaw-Knox Engineers and the proper type of form recommended.



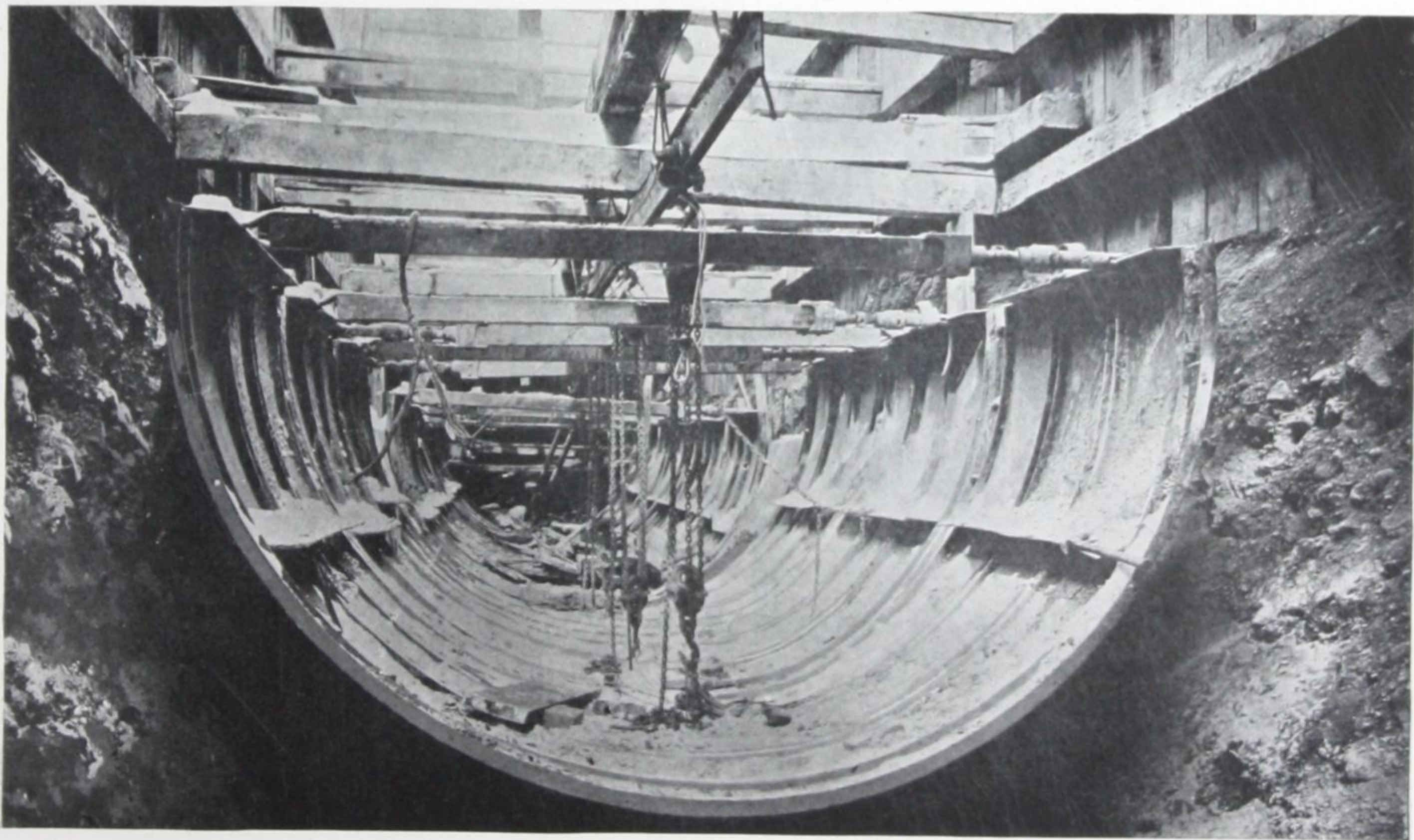


17' circular conduit on Catskill Aqueduct, Keystone State Construction Company, contractor. This conduit was cast as a monolith and Blaw-Knox Forms were designed to telescope and carry invert forms through forms already set, and reset these invert forms on precast blocks seen in foreground. The crown was then set in place by means of the same traveler. Note: Steel inside and bulkhead forms were used as well as steel forms for precast invert blocks.





Blaw-Knox standard half round steel form being used on the crown portion of conduit. Note simplicity of supporting, collapsing and handling forms. As much as 250 lineal feet of this type of form can be moved ahead at one time.



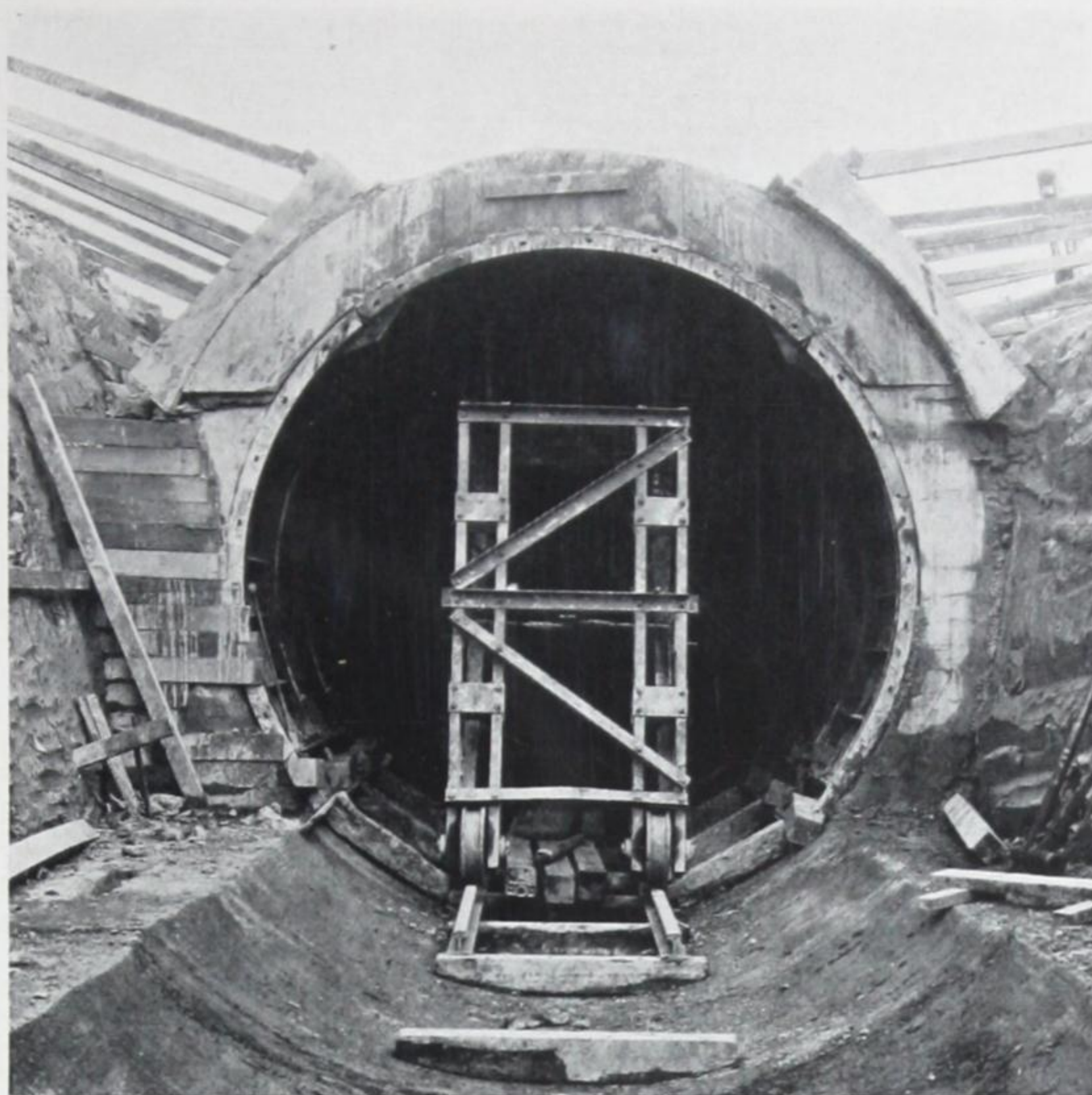
Blaw-Knox standard half round form being used on the lower half of conduit. Illustration shows one of the many ways adopted for moving this type of form ahead.





Special design of telescopic type of Blaw-Knox Steel Forms, 22' x 18'. Mill Creek Sewer, Erie, Pa. Folwell & Ahlskog Company, contractor.



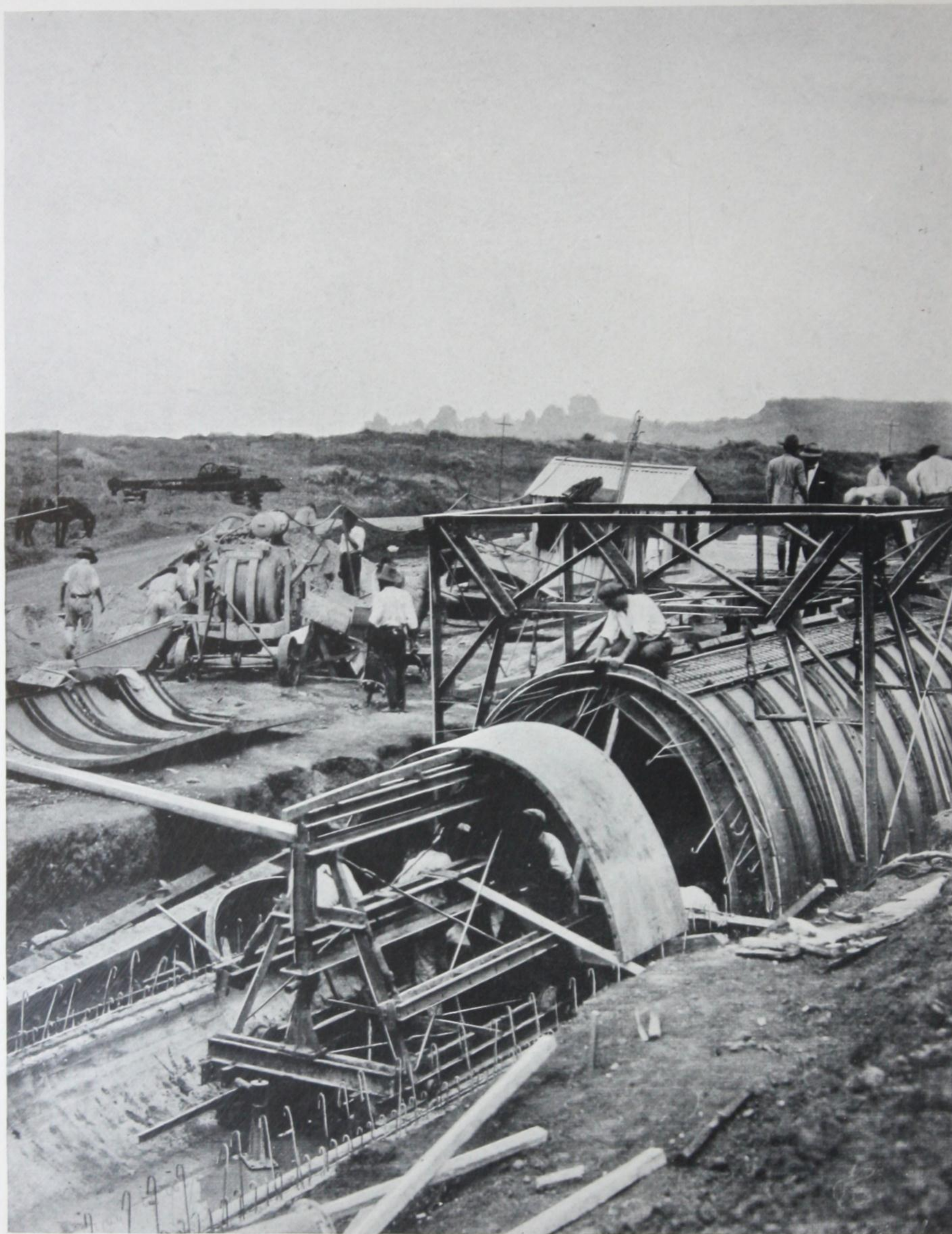


13' 6" diameter sewer, Detroit, Mich., Lennane & McIlvanna, contractors. Invert was constructed ahead by hand screeding, 75 per cent of crown formed by telescopic type of Blaw-Knox Forms.



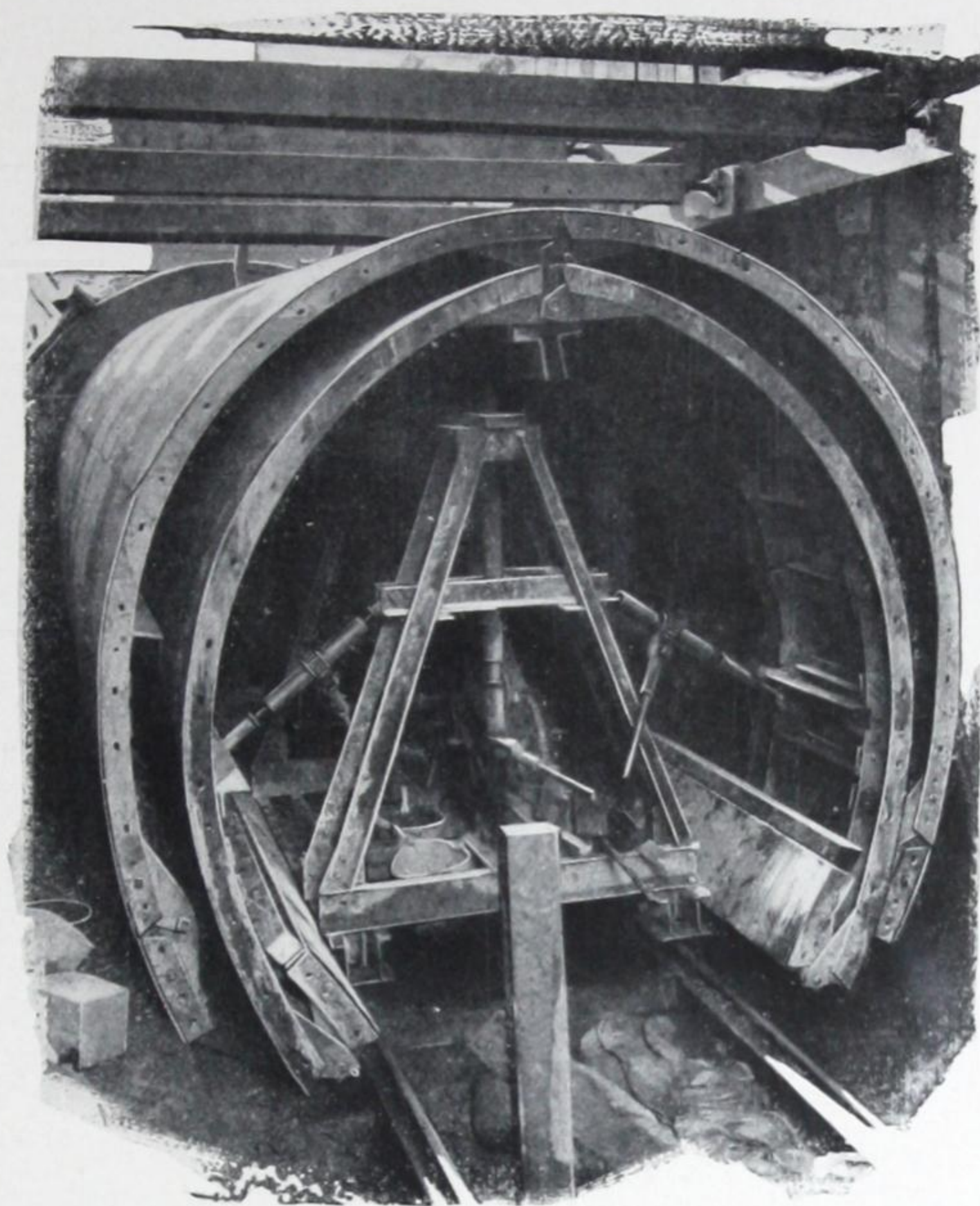
View showing the telescoping on traveler of a Blaw-Knox Steel Form designed to form the entire circle as a monolith. Note arrangement for collapsing and moving form forward.





Rio Claro Aqueduct, Sao Paulo, Brazil. Blaw-Knox traveling telescopic steel forms, 8' 10" horseshoe shape.  
Blaw-Knox Steel Forms were used for outside as well as inside with steel bulkheads.





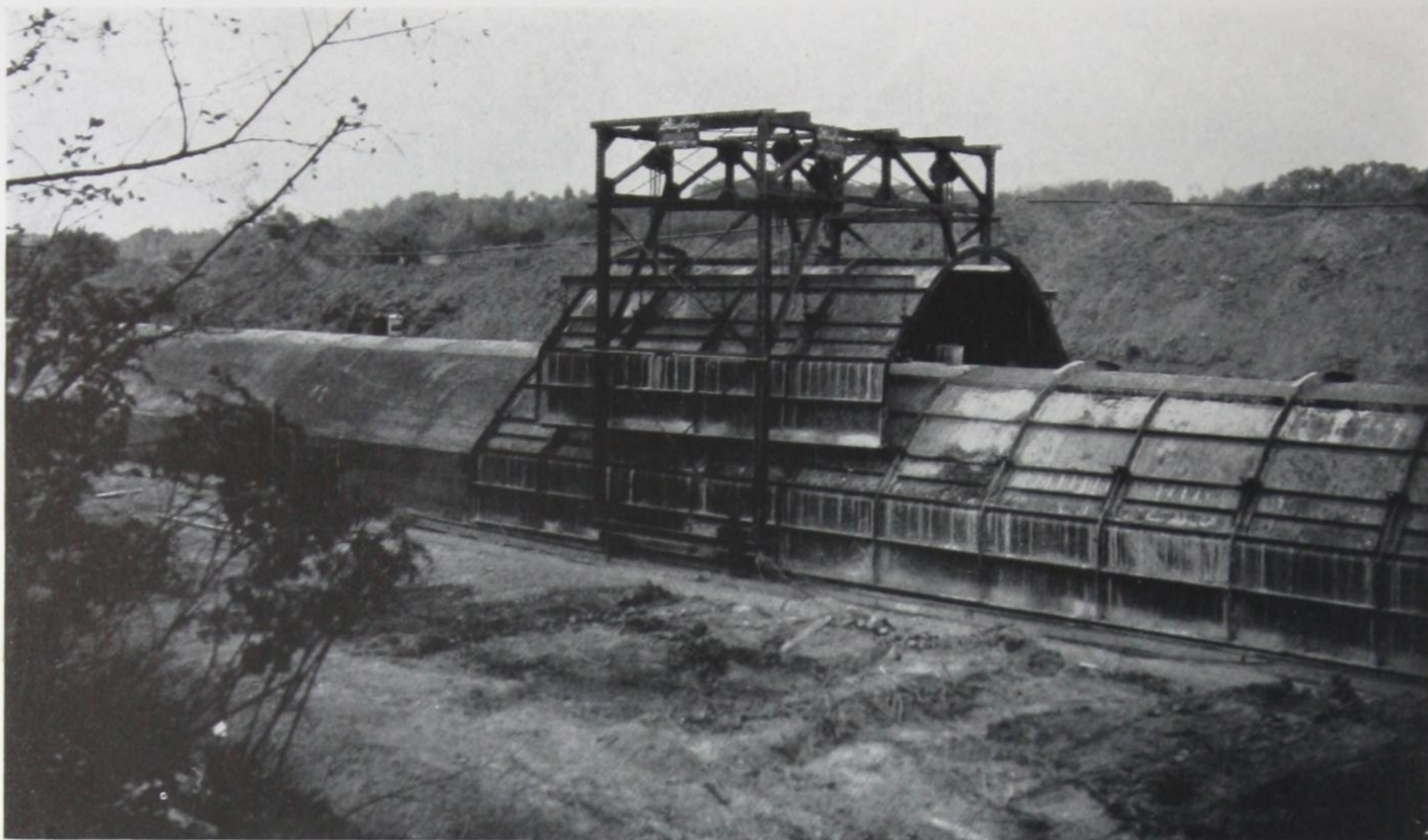
## Horseshoe Shaped Conduits

**M**ANY horseshoe shaped conduits lend themselves, not only to the efficient use of interior forms, but also to the use of steel forms for the exterior, the bulkheads and invert.

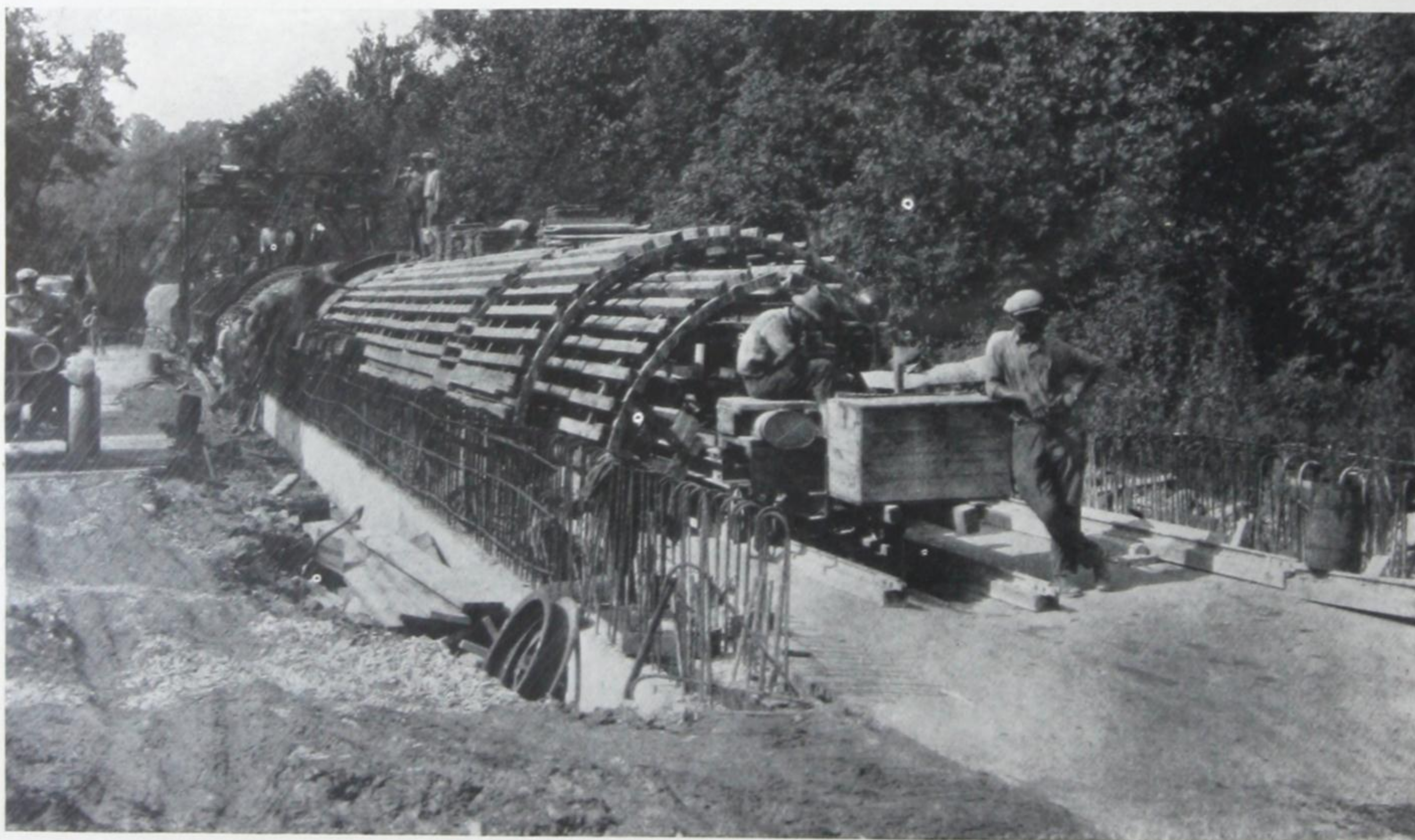
In general, the telescopic type of Blaw-Knox interior form is the best suited for this particular type of conduit, but in many cases a non-telescopic type proves the most adaptable.

The illustrations in this section show both types of form, a definite recommendation being made by Blaw-Knox Engineers as to which type to use in connection with each particular contract.



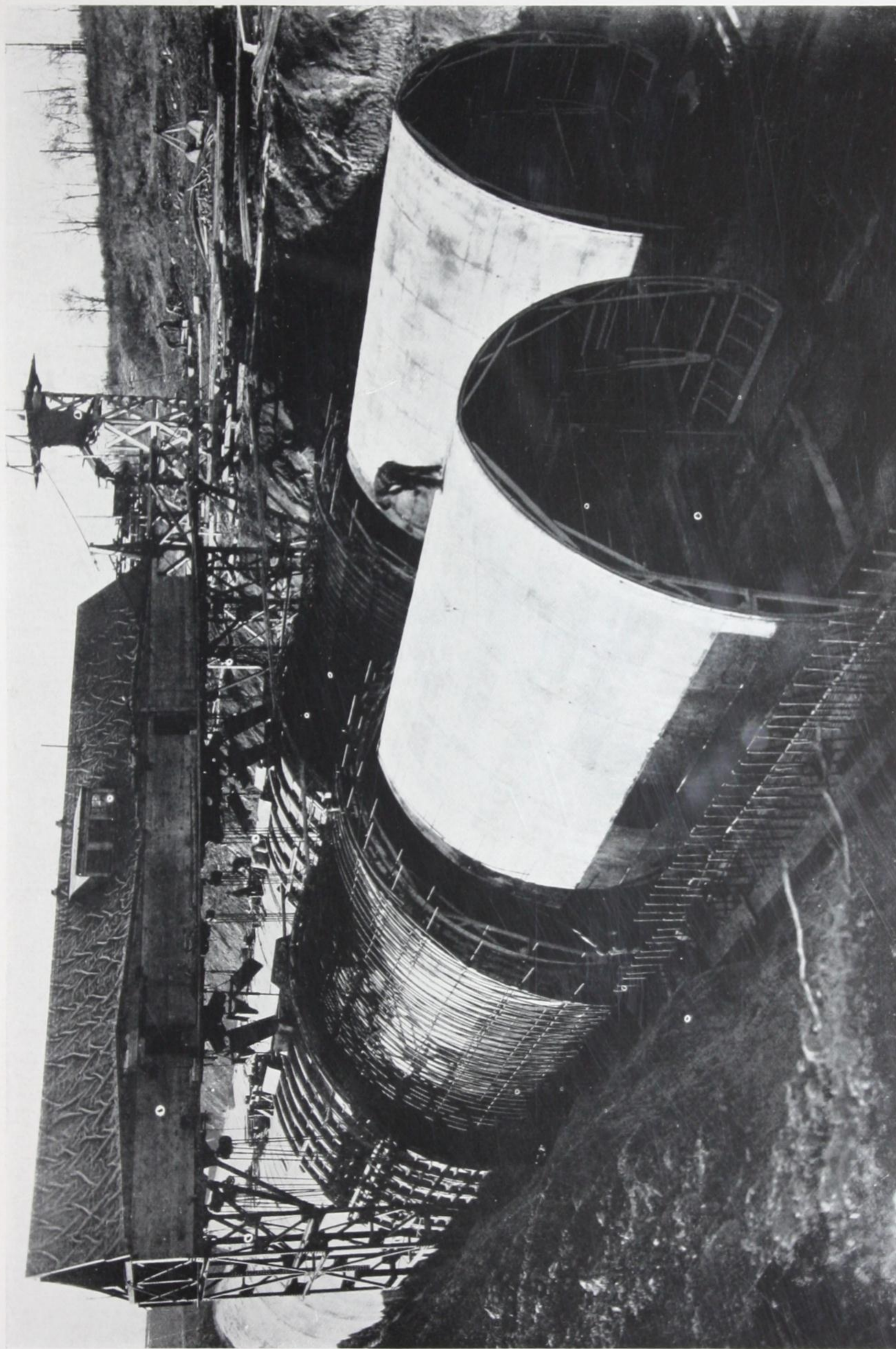


Cuyahoga River Outfall Sewer, Akron, Ohio. Outside forms with motor-driven traveler for handling forms. Holmes Construction Company, contractors. See letter on page 111 from Mr. Stelhorn, chief engineer, giving details about progress of the work.



Motor-driven traveler for handling 20' sections of Blaw-Knox Forms for 7' 6" x 12' 0" sewer described above. Inside lined with terra cotta tile. Note special provision for attaching tile. Equipment furnished was 380 lineal feet of inside form and 180 lineal feet of outside form. One inside and one outside traveler were provided. Progress was 75 lineal feet per day.





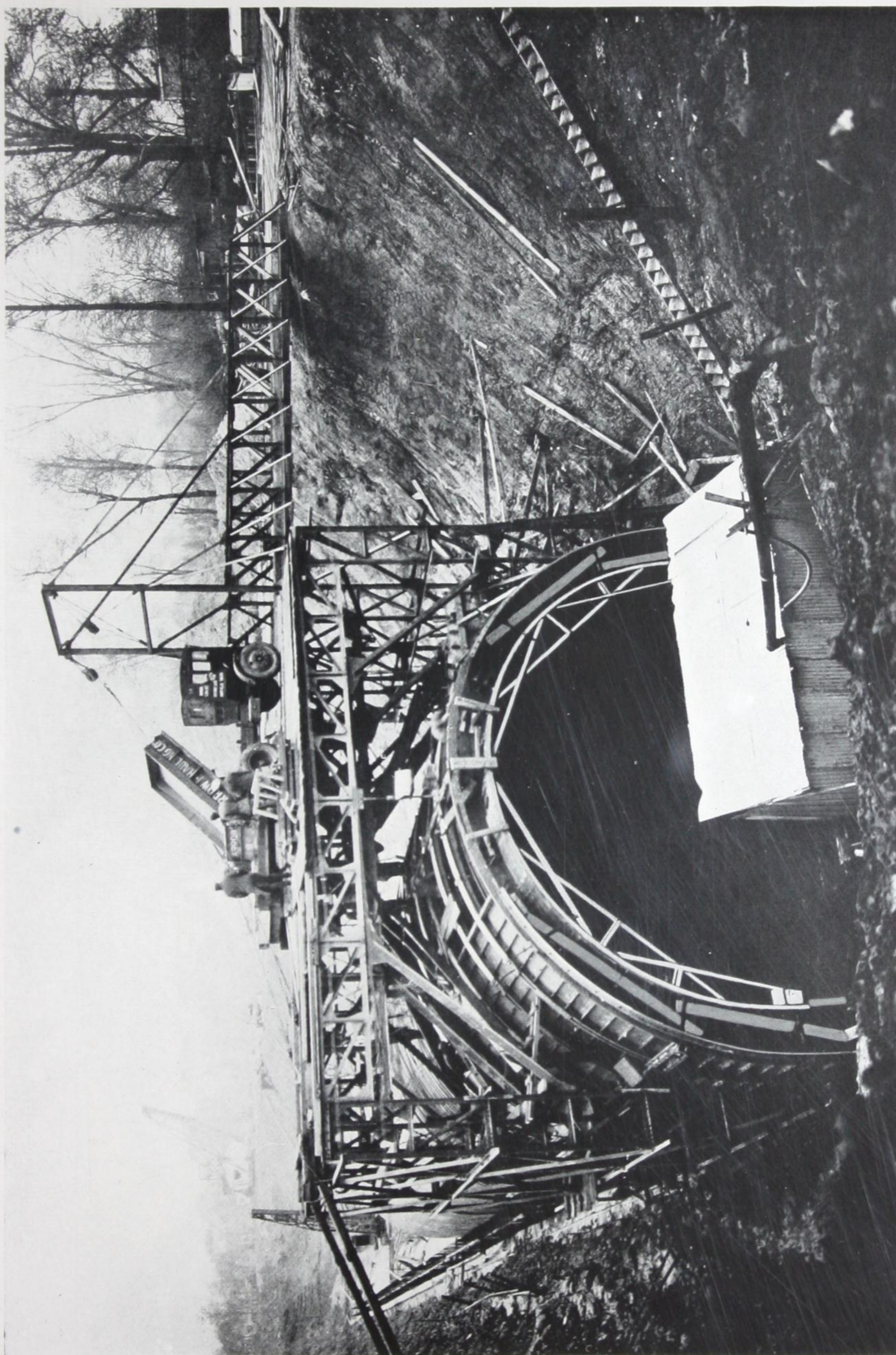
29' inside and outside Blaw-Knox telescopic steel sewer forms working on tangent and curve, River Des Peres Drain, St. Louis, Mo.  
A. Guthrie & Co., Inc., contractor.





Another view of River Des Peres Drain, showing finished work.





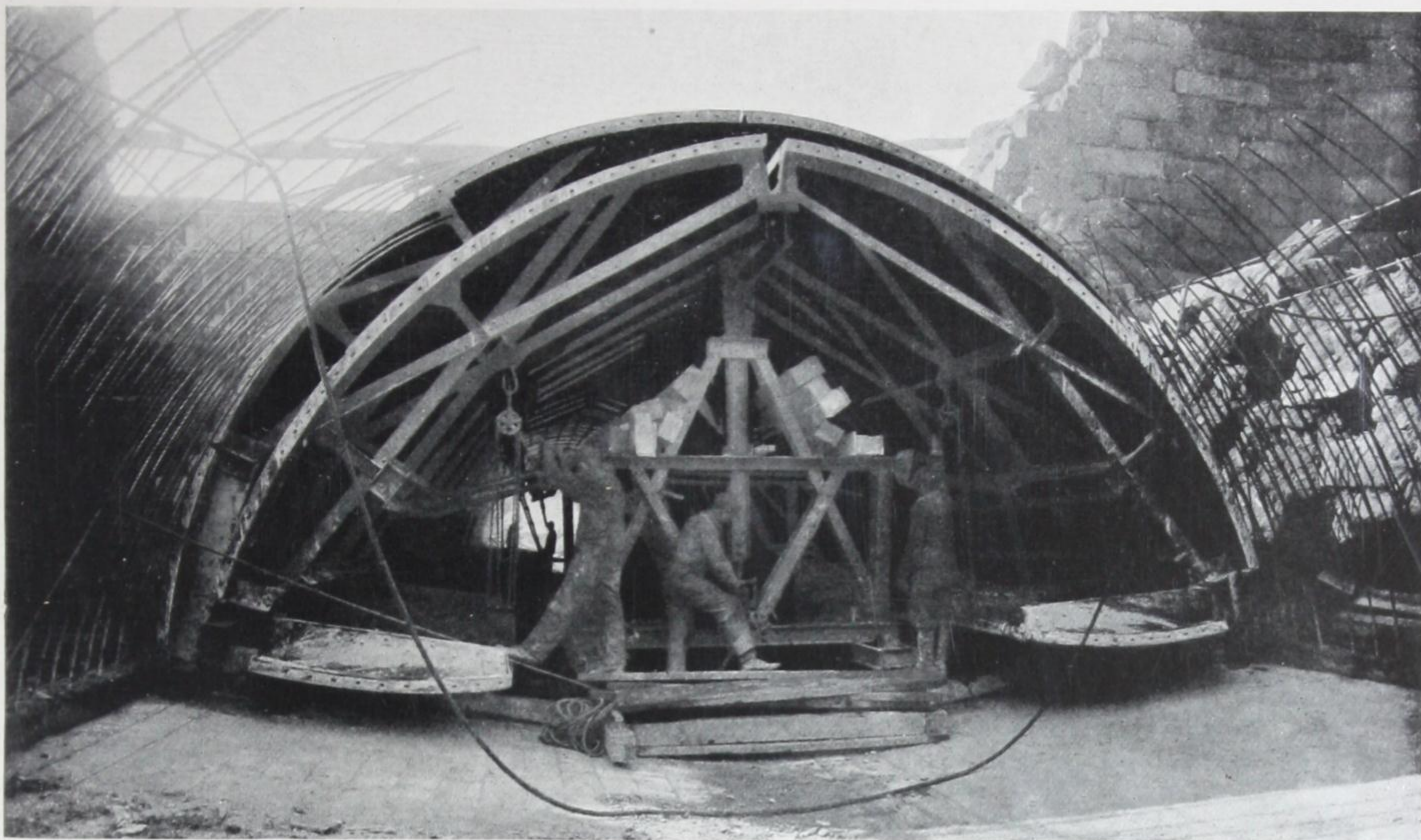
Traveling telescopic sewer forms 32' x 25' 7 1/2". Note concrete hopper mounted on top of traveler taking concrete from trucks running over steel bridge.  
River Des Peres Drain, St. Louis, Mo. W. E. Callahan Construction Company, contractor.



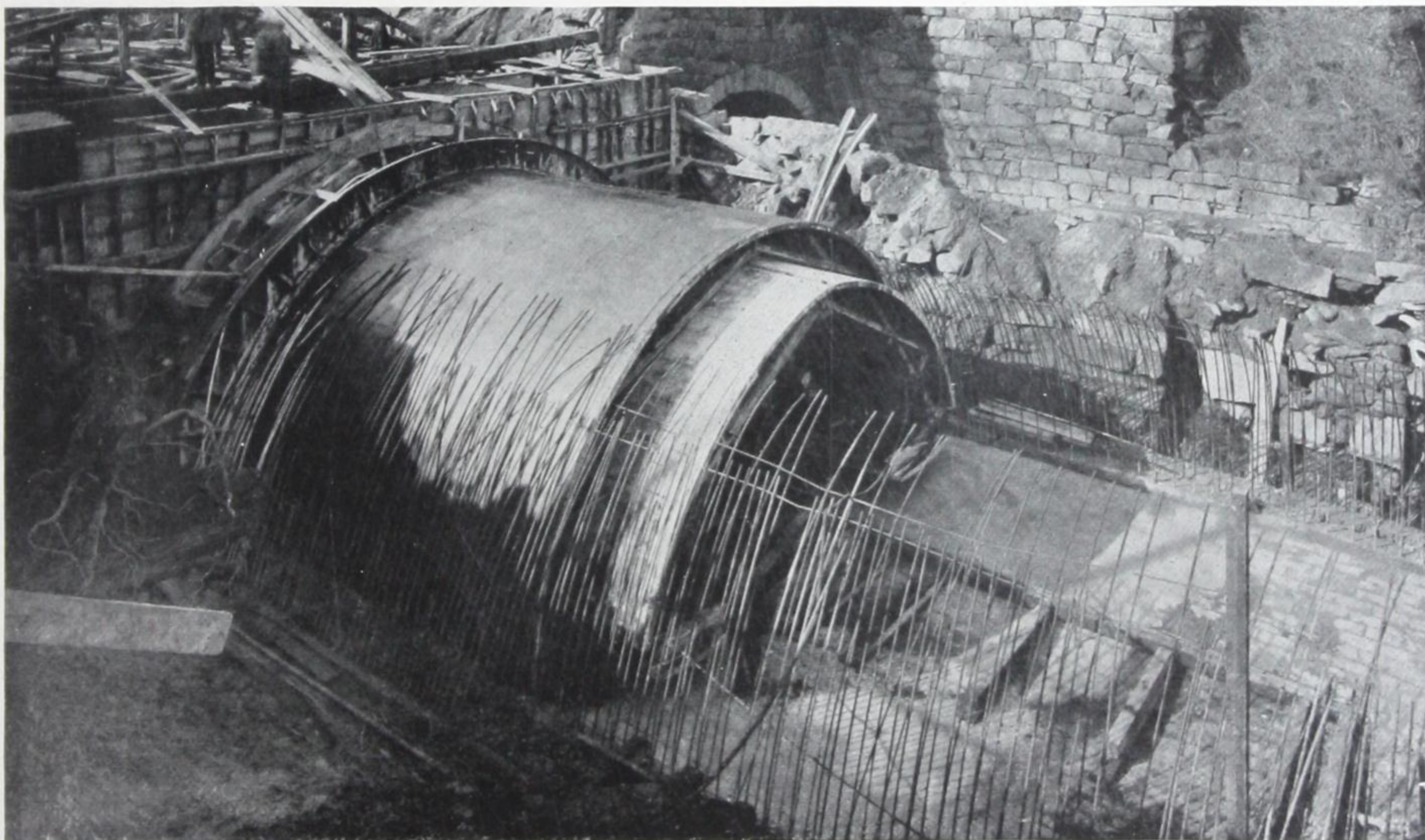


Another view of River Des Peres Drain.



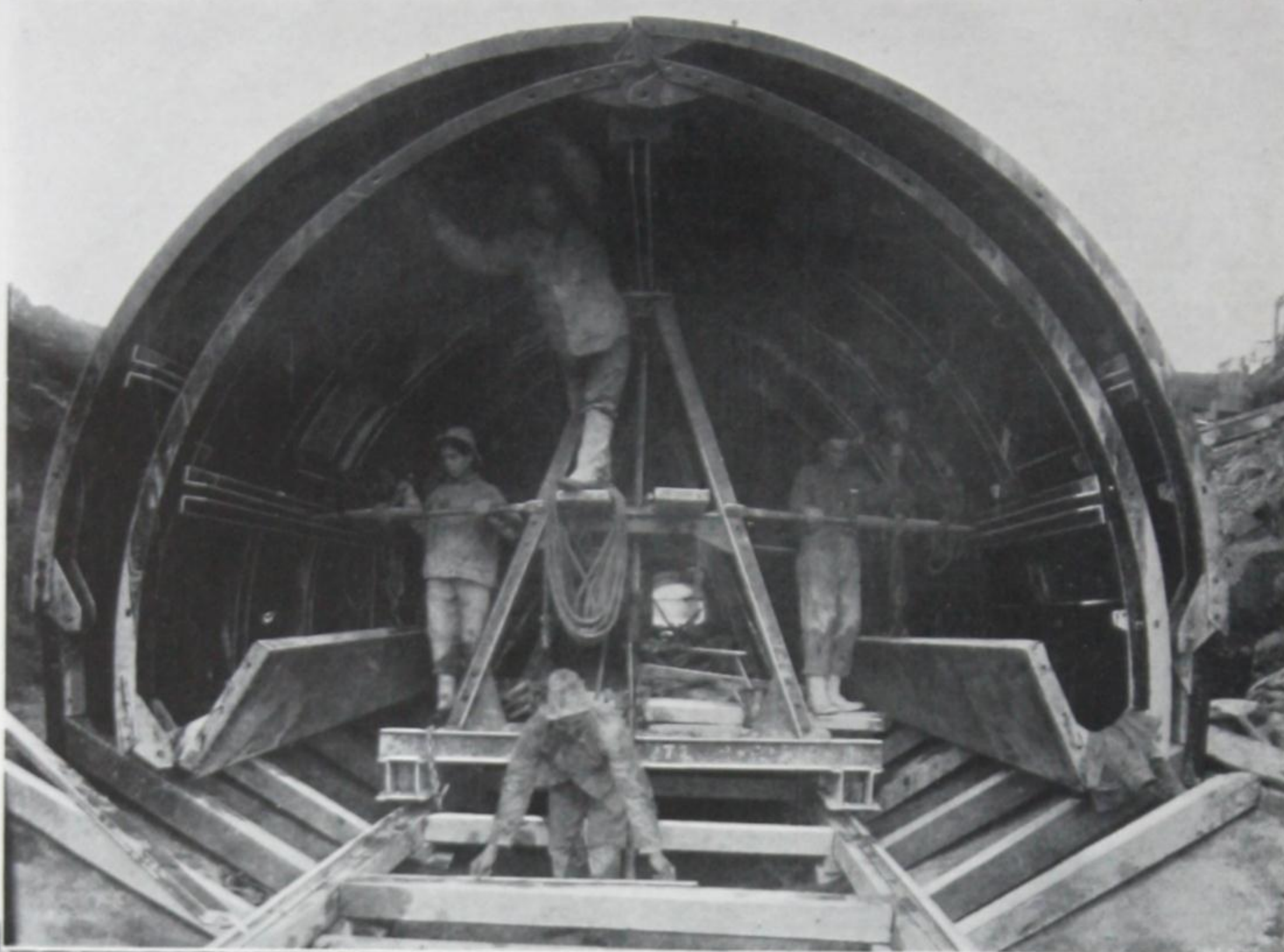


Blaw-Knox traveling telescopic steel forms 29' wide by 16' 3" high used in construction of Shockoe Creek Sewer, Richmond, Va. Whiting-Turner Construction Company, contractors. (See letter on page 109.)

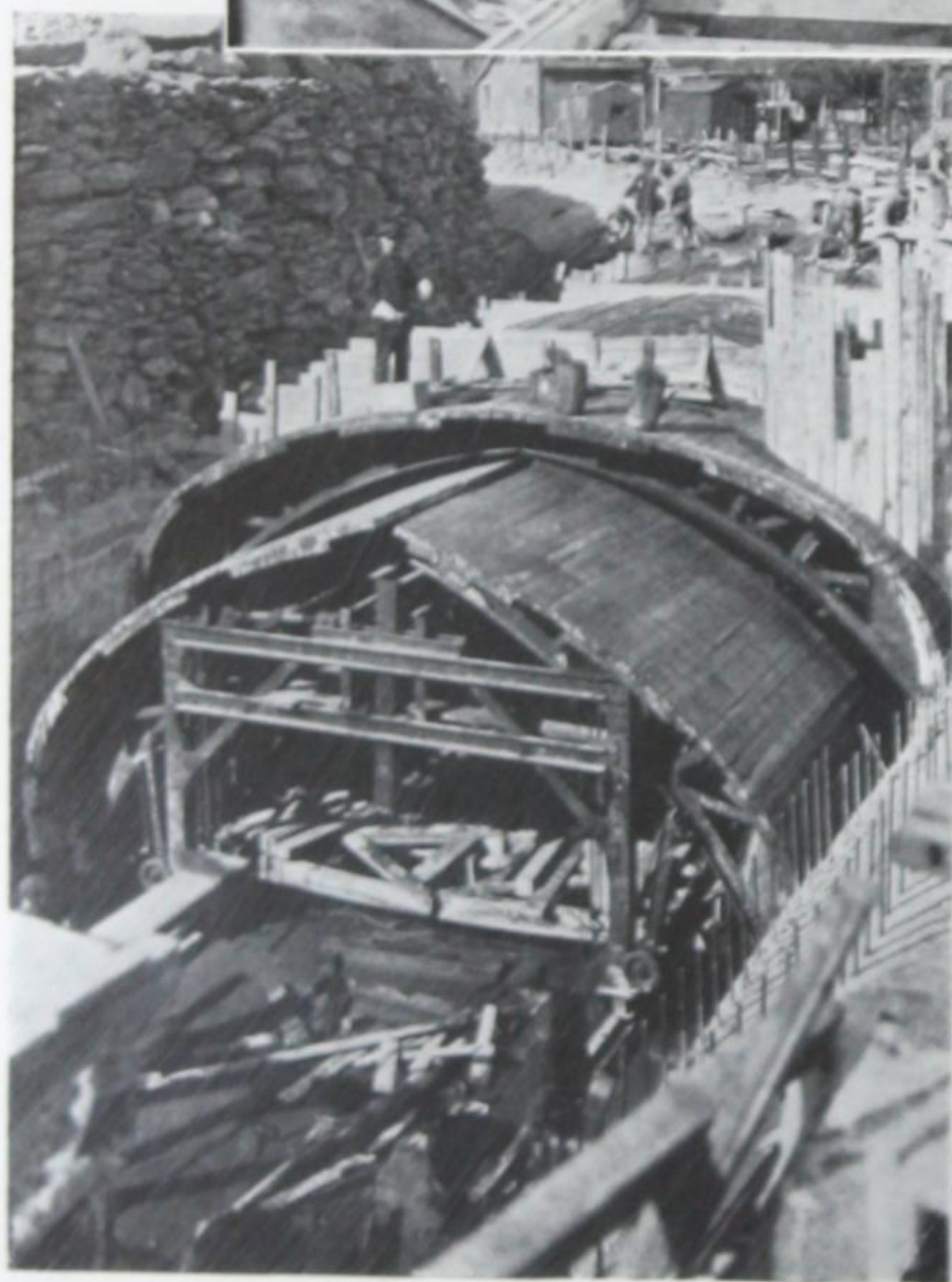


Another view of sewer shown above illustrating inside forms being moved ahead through forms in place. Note shoulder on invert to facilitate proper setting of forms.



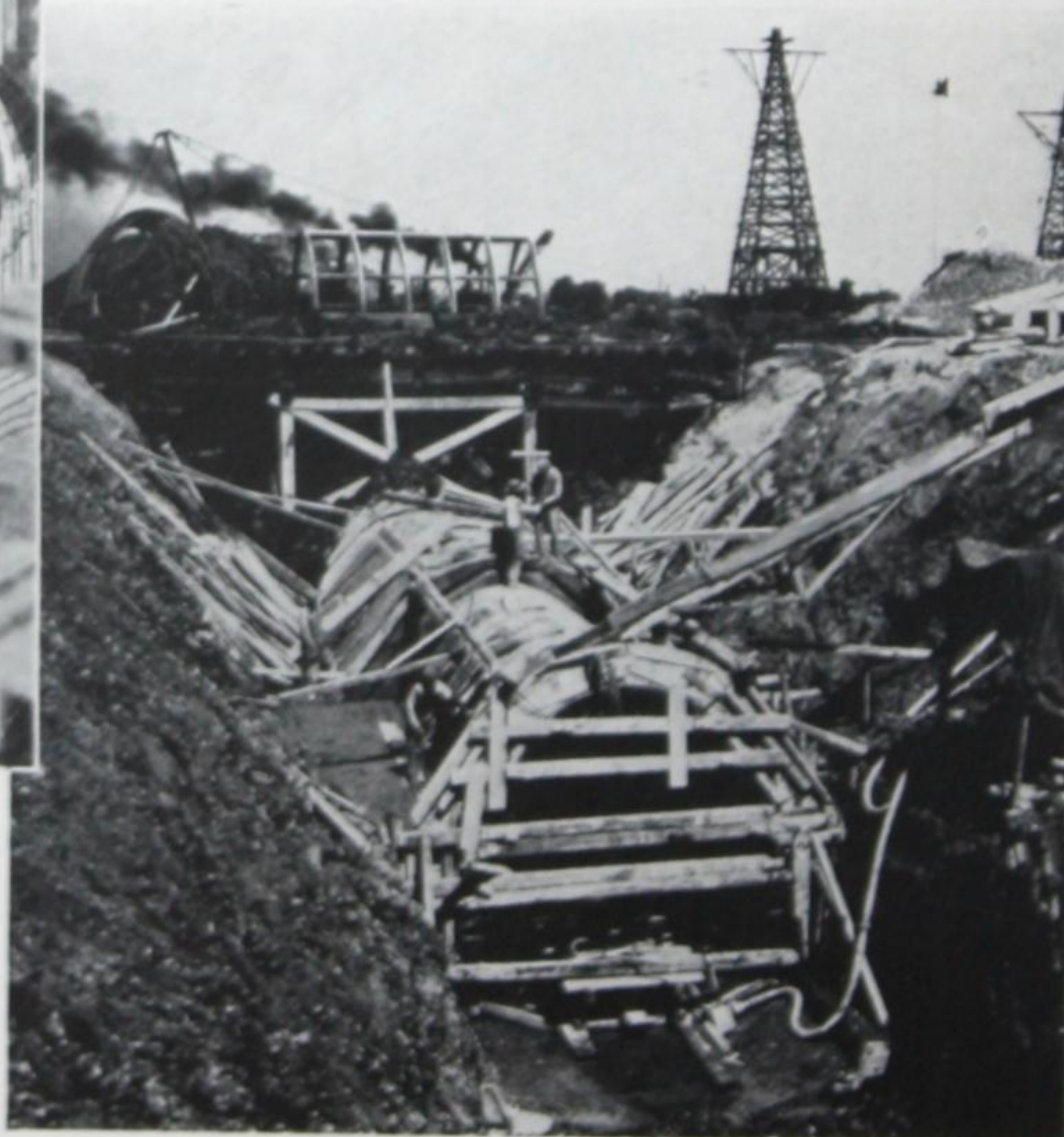


Typical traveling telescopic sewer form. Note simplicity in operation and bracing shown in this type of form.



Scajaquada Creek Drain, Buffalo, N. Y. Frank L. Cohen, Inc., contractor. Special design wood lagged form. Maximum section 33' 6" wide by 14' high. Form was adjustable to several widths. See letter on page 110.

Sewage Disposal Plant, Chicago, Ill. T. J. Forschner Contracting Company, contractors. Standard Blaw-Knox telescopic sewer form 13' x 13'. Note the assembly of a complete 25' section on bank ready to be lowered into ditch for instant service.



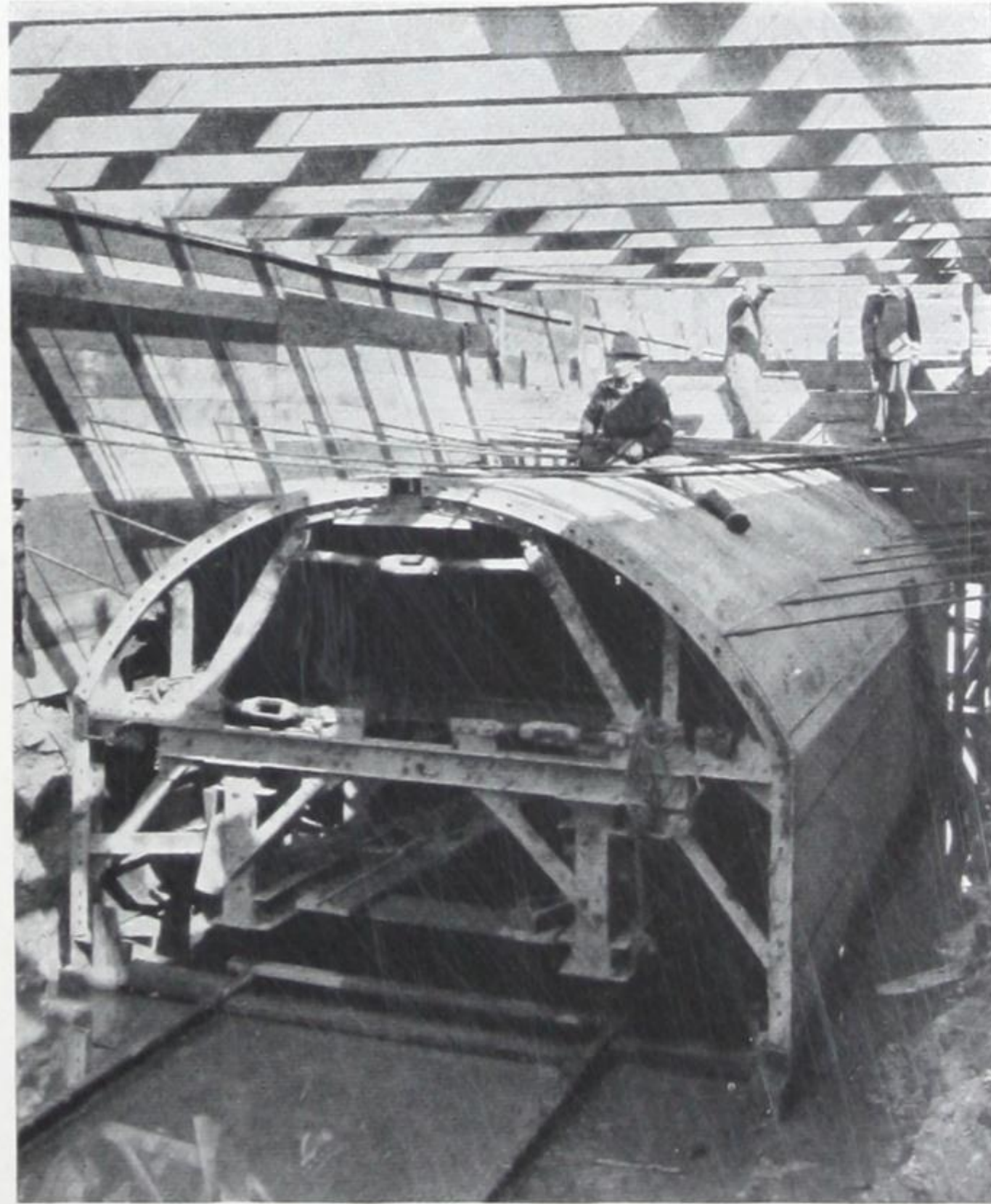




Blaw-Knox standard telescopic horseshoe forms, used on curves.

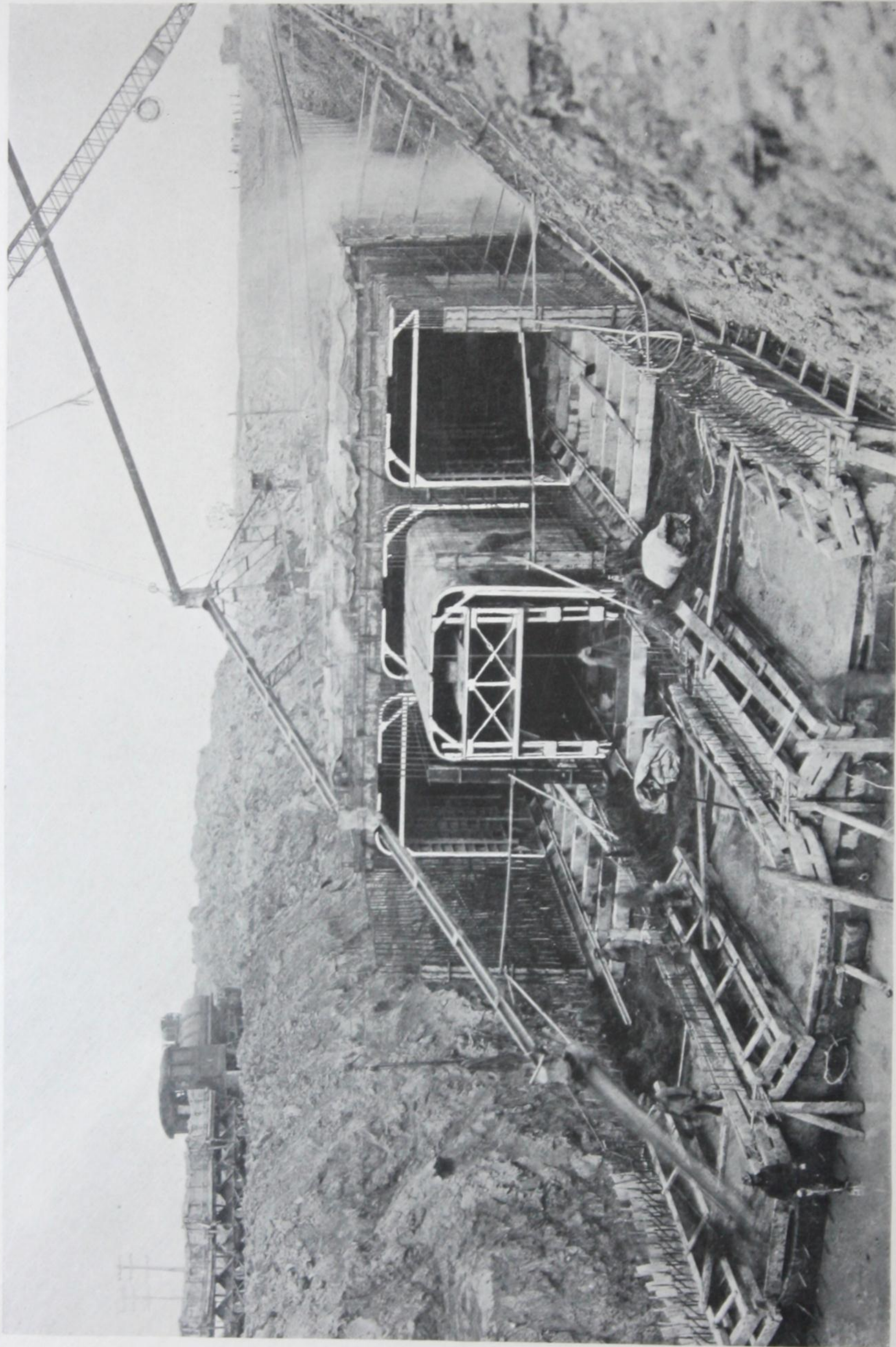


Washington Aqueduct, Washington, D. C. McLean Contracting Company, American Paving and Construction Company, Arundel Corporation, contractors. Blaw-Knox non-telescopic horseshoe shaped forms used on this work. Also steel outside forms and traveler and steel bulkheads.



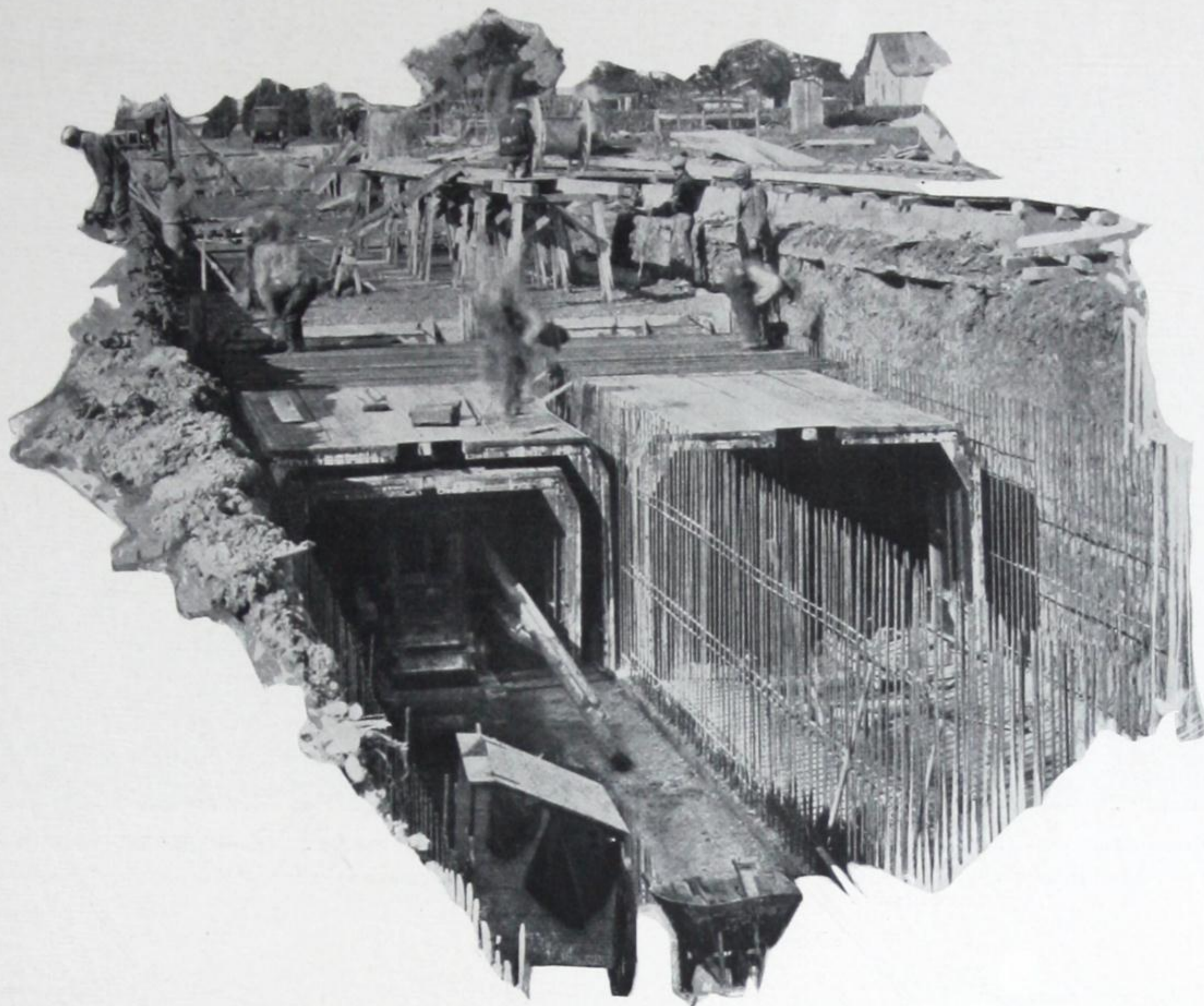
Sewer in concrete wall, Joliet, Ill. Green & Sons, contractors. 12' x 8' 8" non-telescopic form used in forming drain through footing of wall. See illustration on page 43 for wall form.





Connors Creek Sewer, Detroit, Mich. T. A. Gillespie Company, contractor. Telescopic rectangular type Blaw-Knox Forms for triple barrel 15' 9" x 17' 6". 25 lineal feet per day of finished structure were completed with the use of 125' of form and one traveler in each barrel. See letter from Thos. H. Gillespie on page 108.



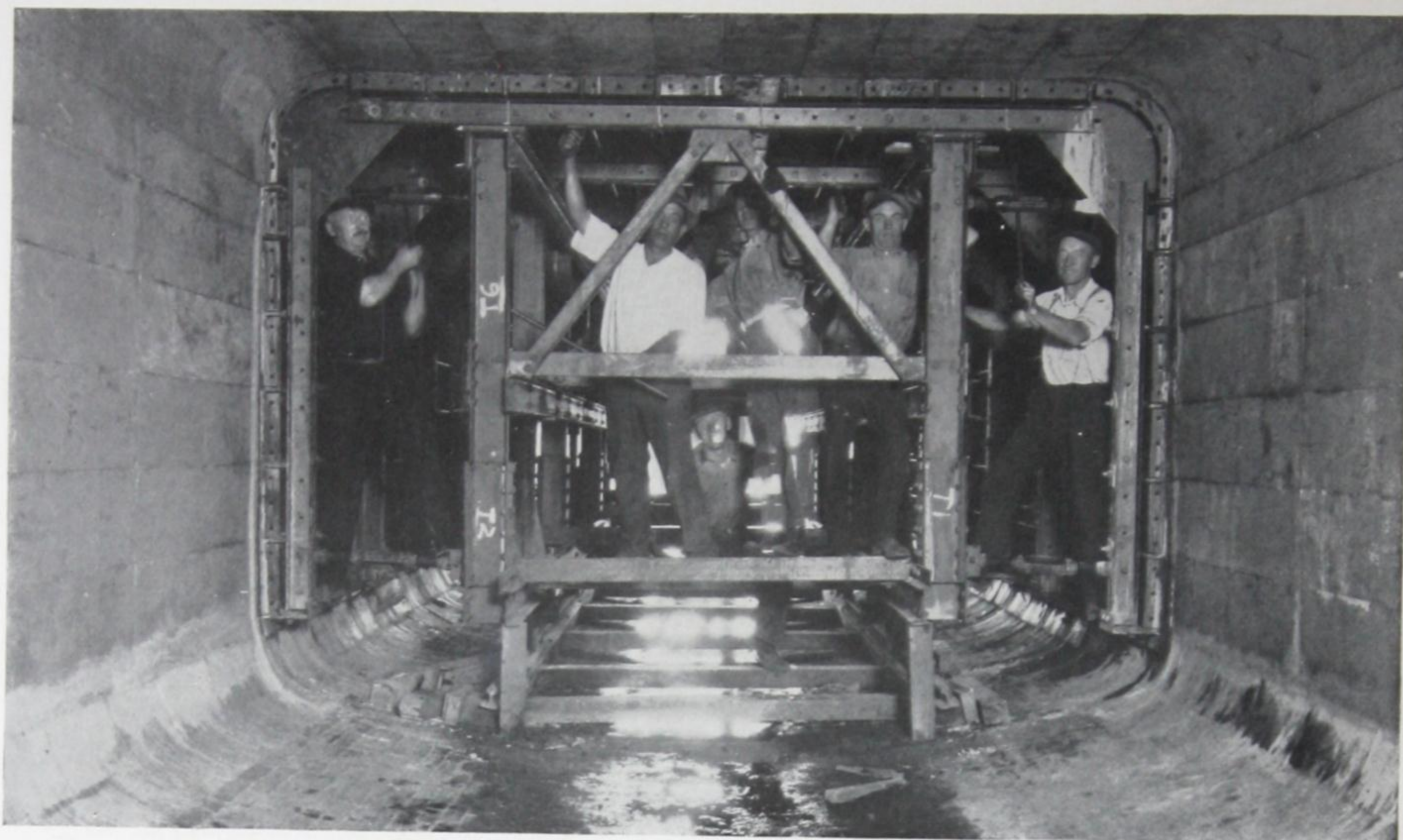


## Rectangular Concrete Conduits

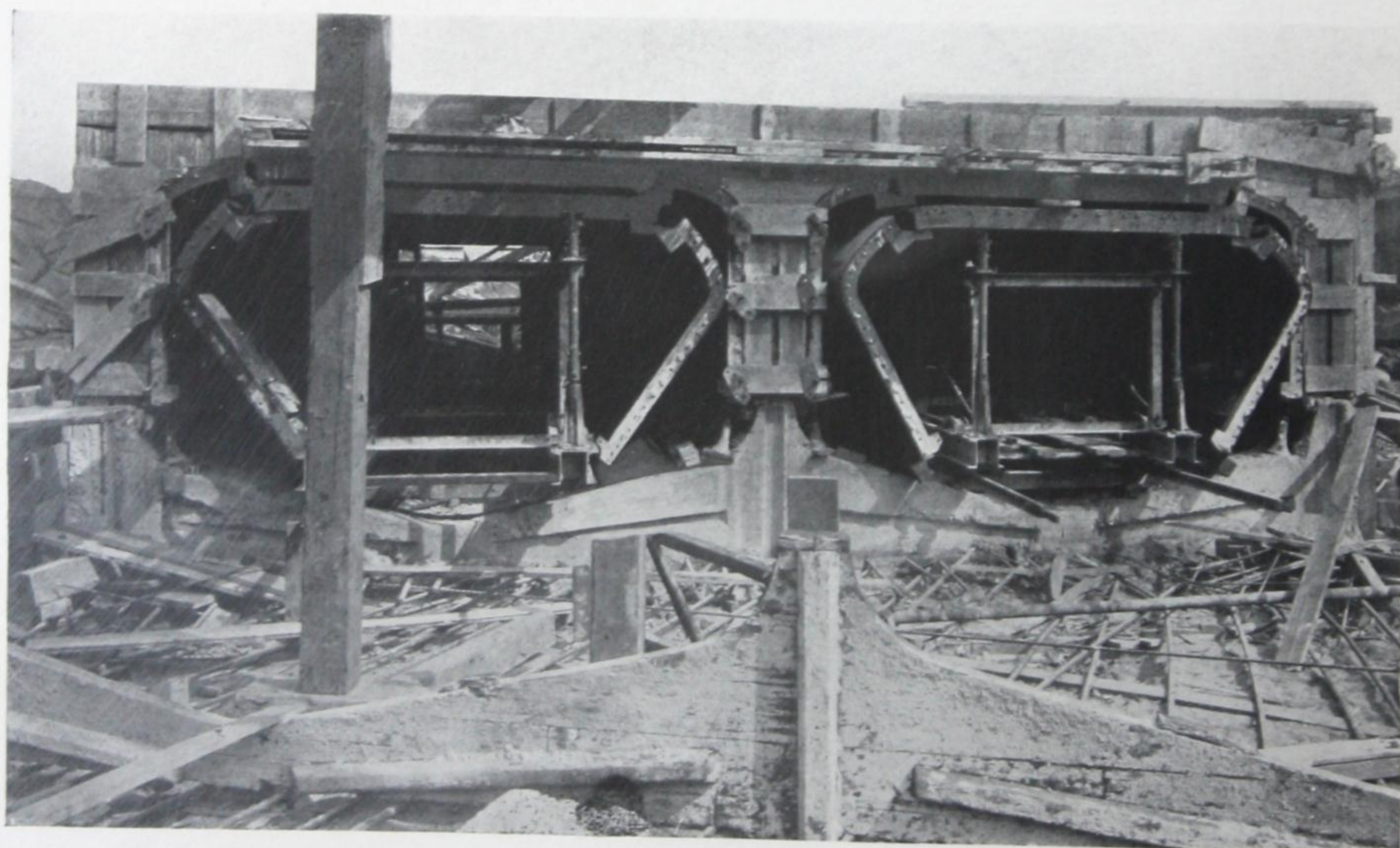
**Y**EARS of experience in furnishing steel forms for use on rectangular conduit construction, places our engineers in position to recommend a proper type of form for each contract.

When specified, rectangular steel forms are designed for adjustment to size, enabling many sizes of conduit to be poured with the same form. These adjustments can be embodied in either the telescopic or non-telescopic type of Blaw-Knox Form.



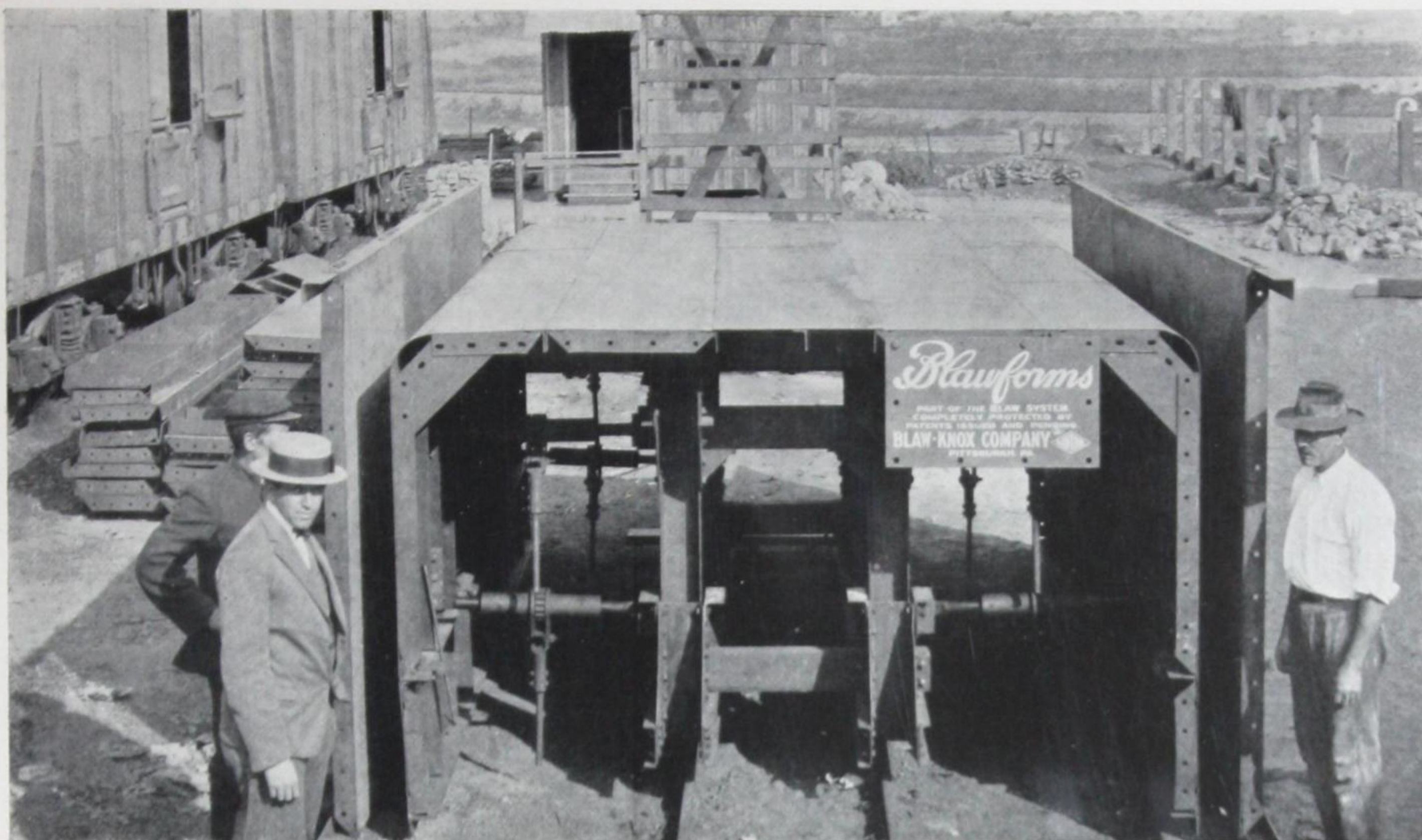


Brooklyn Sewers, Brooklyn, N. Y. Montrose Contracting Company, contractor. Blaw-Knox non-telescopic rectangular sewer form 8' 6" by 14' 0" adjustable to various sizes. Traveler is integral with the form.

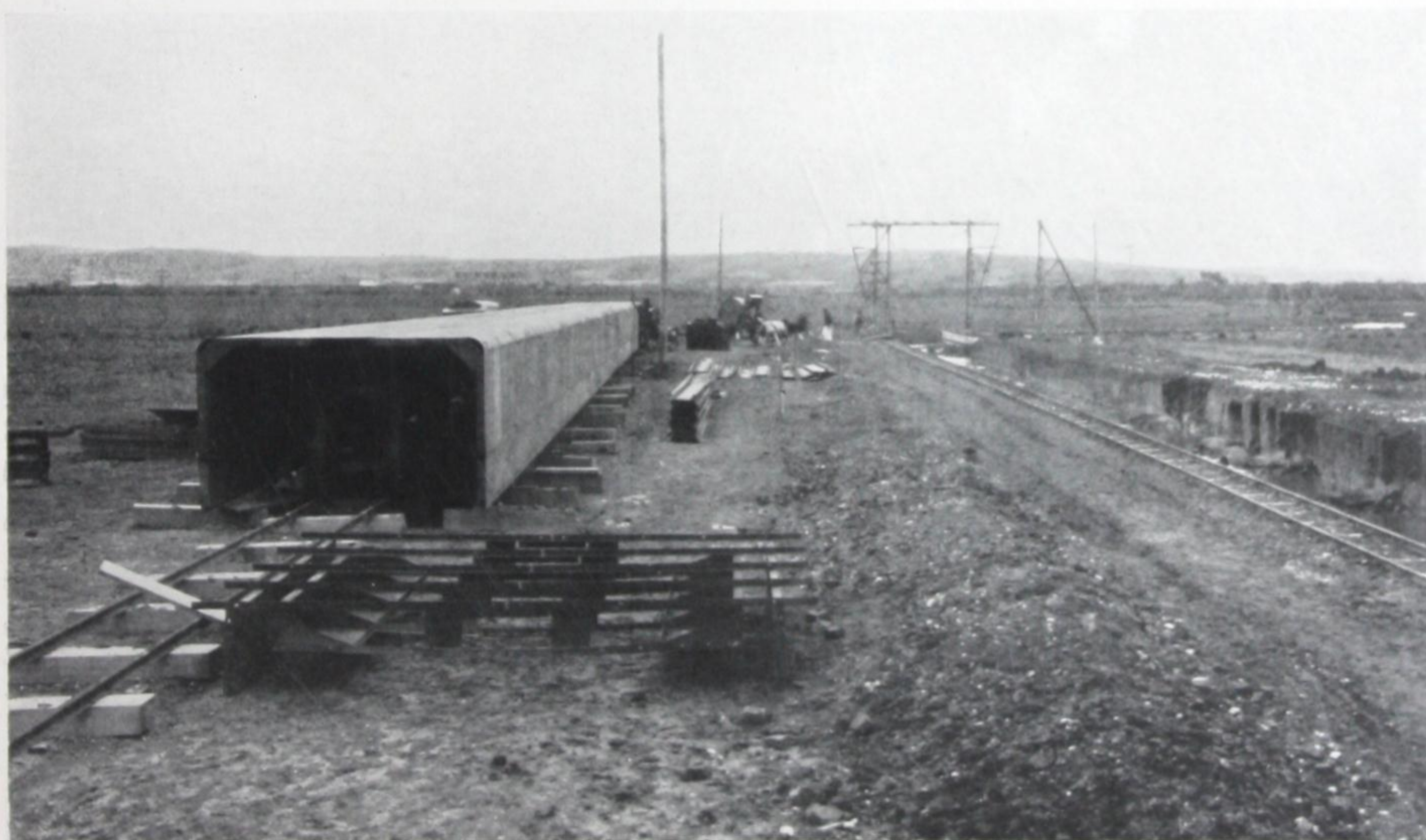


Brooklyn Sewers, Brooklyn, N. Y. John F. Cogan Contracting Company, contractor. Blaw-Knox telescopic sewer forms 13' 2" by 6' 6".



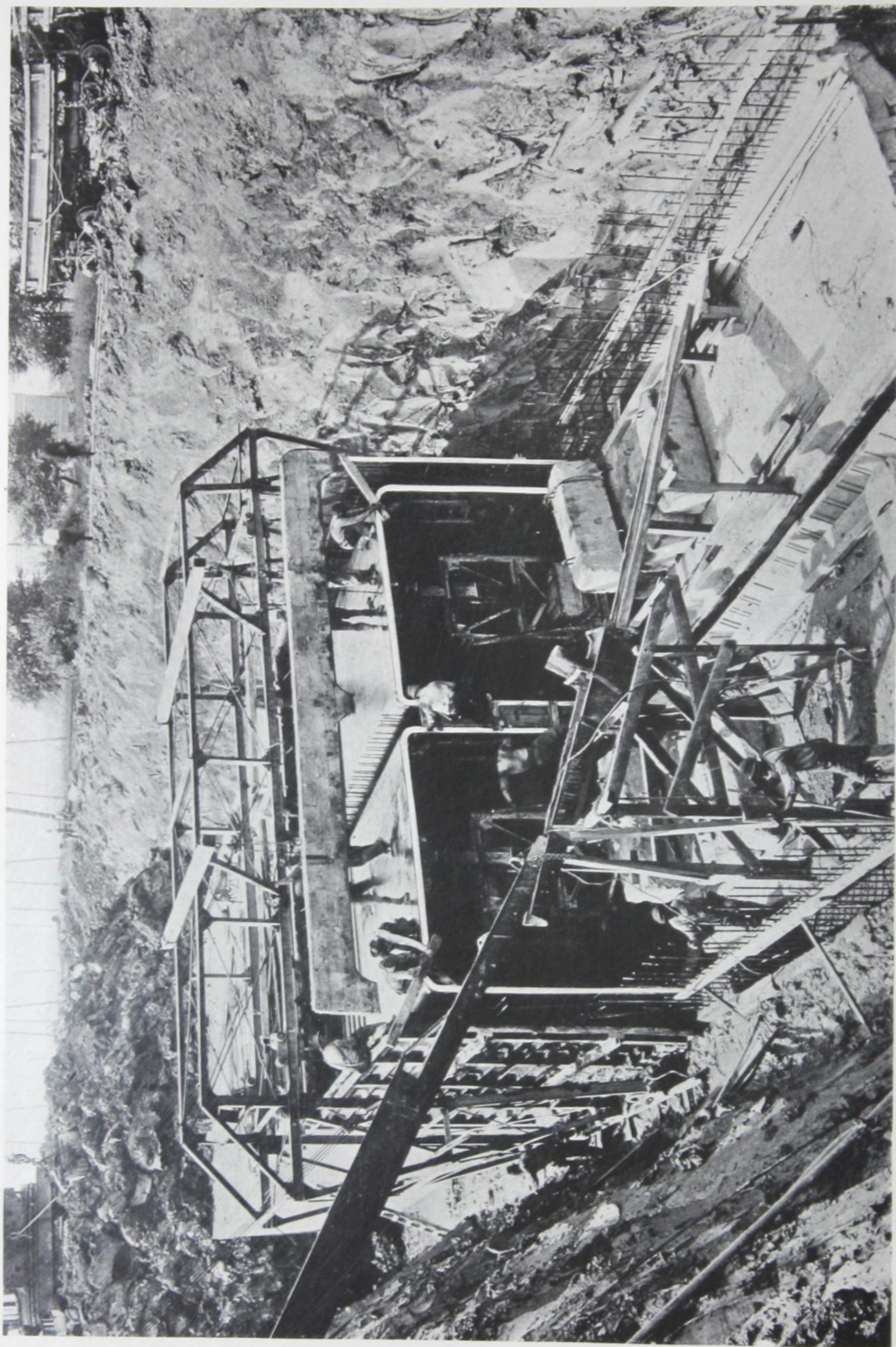


City of Sao Paulo Sewer, Sao Paulo, Brazil. Blaw-Knox telescopic rectangular type sewer form with outside forms.  
 Photograph illustrates a 15' unit set up in the field.



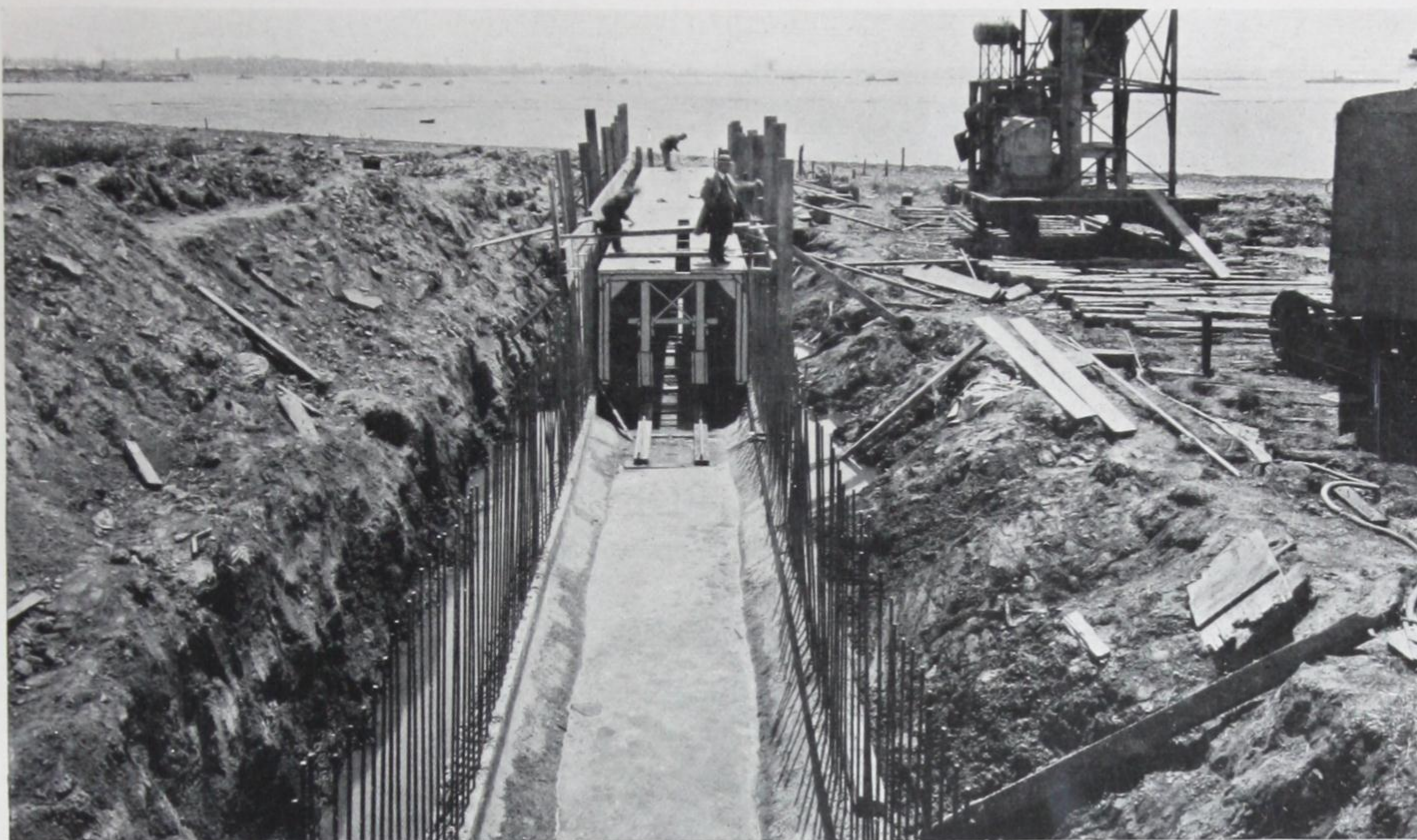
Another view of form described above.



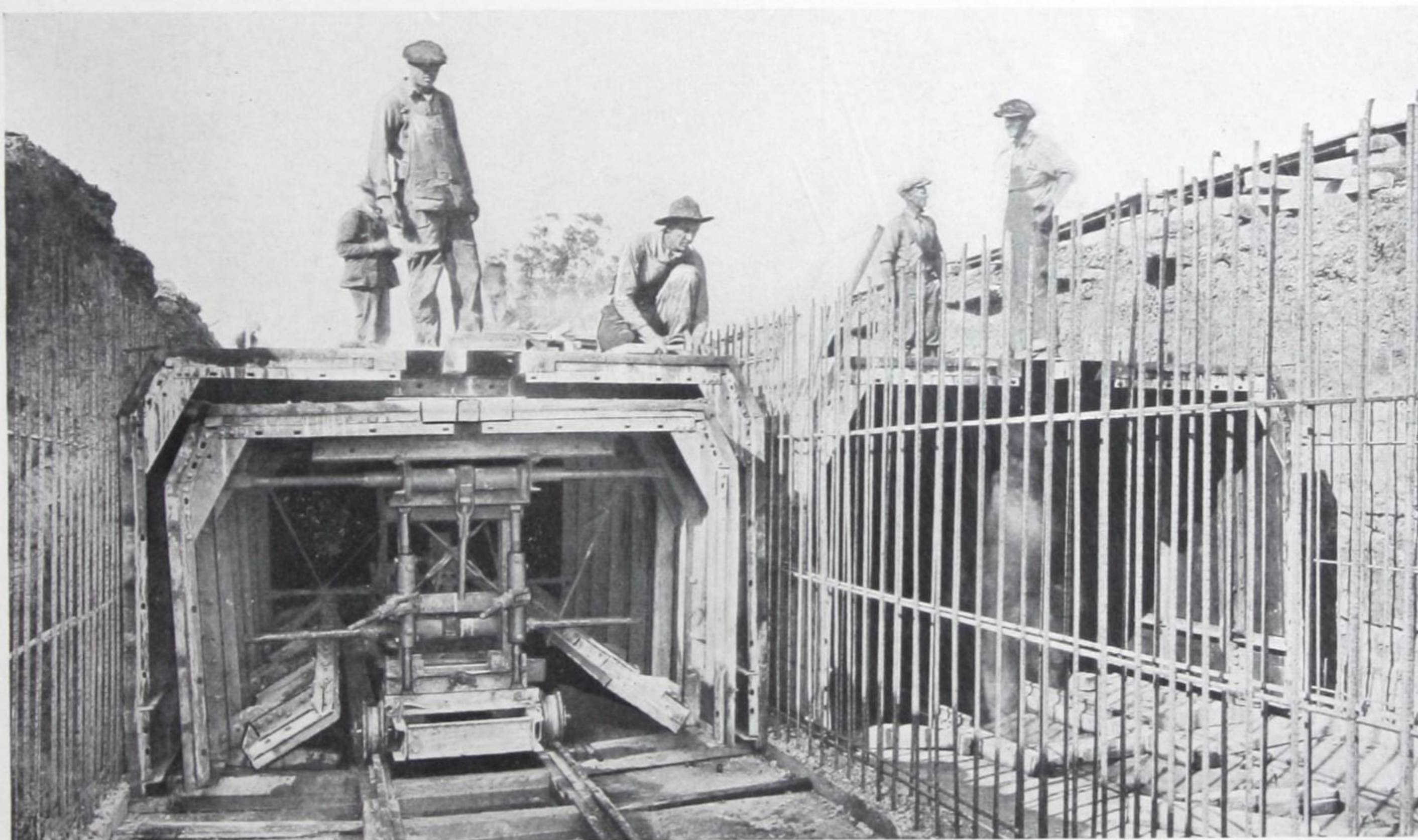


Blaw-Knox telescopic rectangular sewer form 14' x 14½' with outside forms and traveler. Lonyo Road Sewer, Detroit, Mich. Walbridge & Aldinger, contractors. Note traveling outside forms.



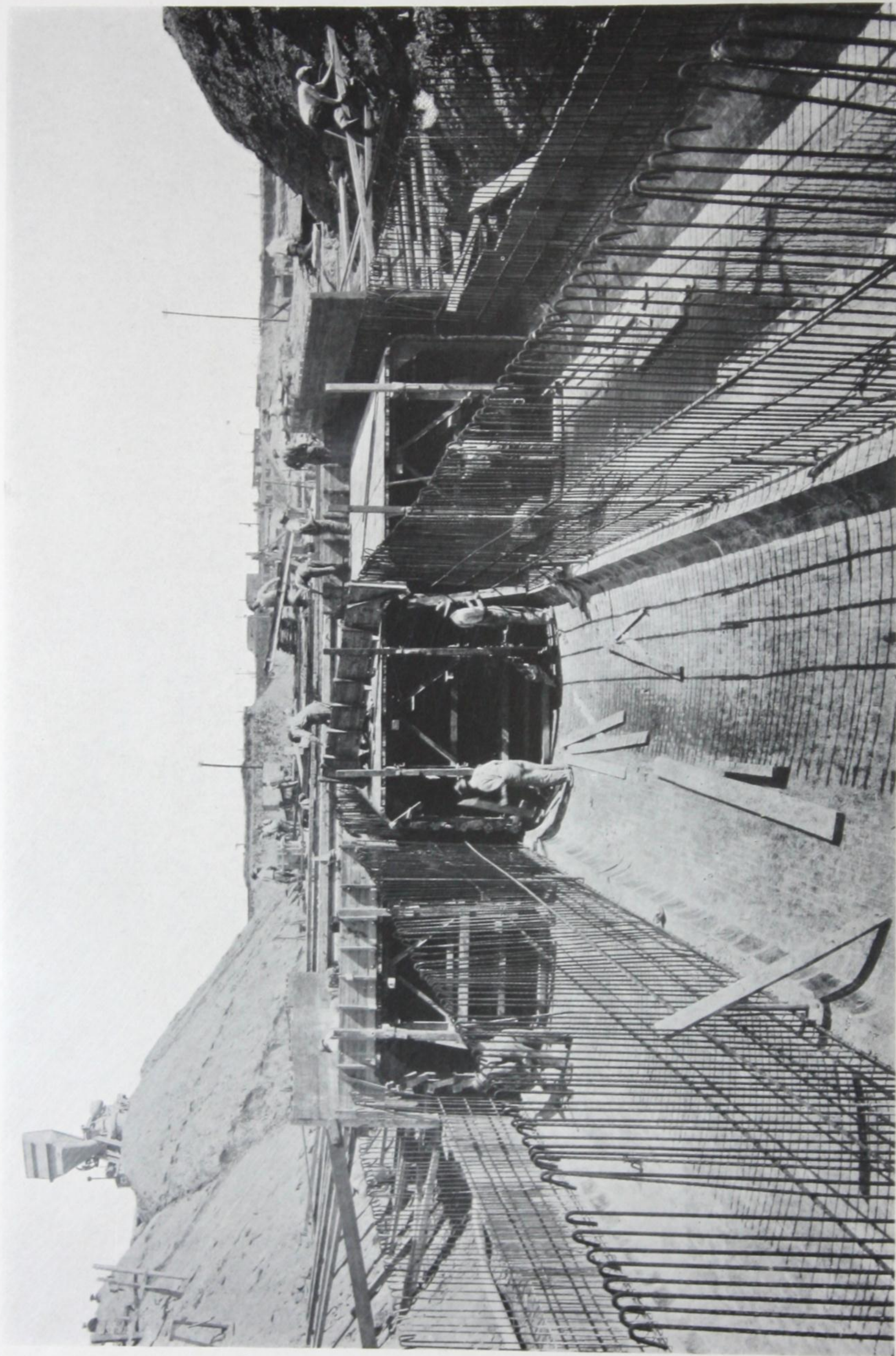


Blaw-Knox non-telescopic sewer form 7' x 8'. Detroit Sewers. C. A. Handeyside Construction Co., contractor.  
Note curb cast integral with invert. See letter, page 107.



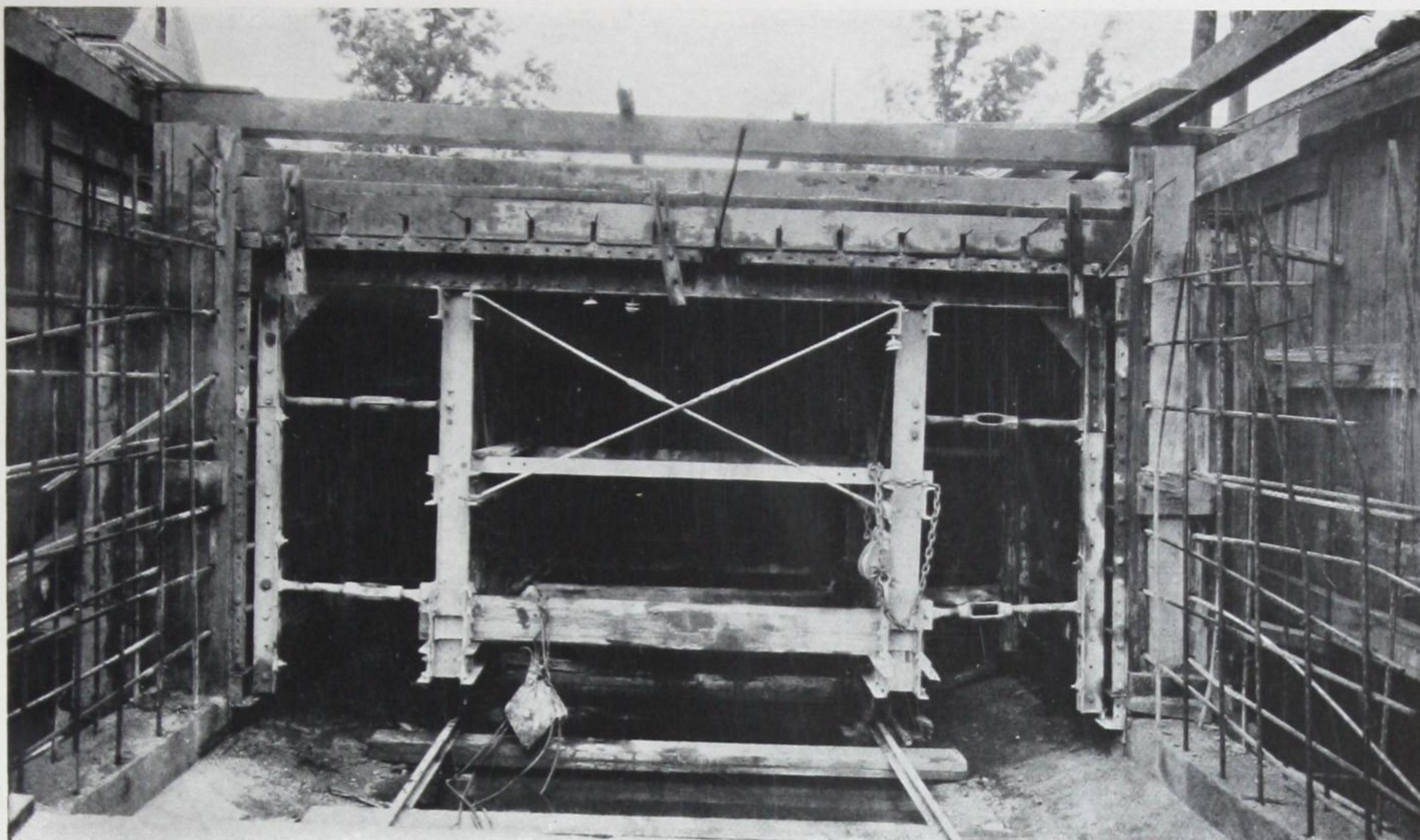
Blaw-Knox telescopic type rectangular forms 9' 7" x 6' 7". Los Angeles Sewers. McDonald and Kahn and Peter R. Gadd, contractors.



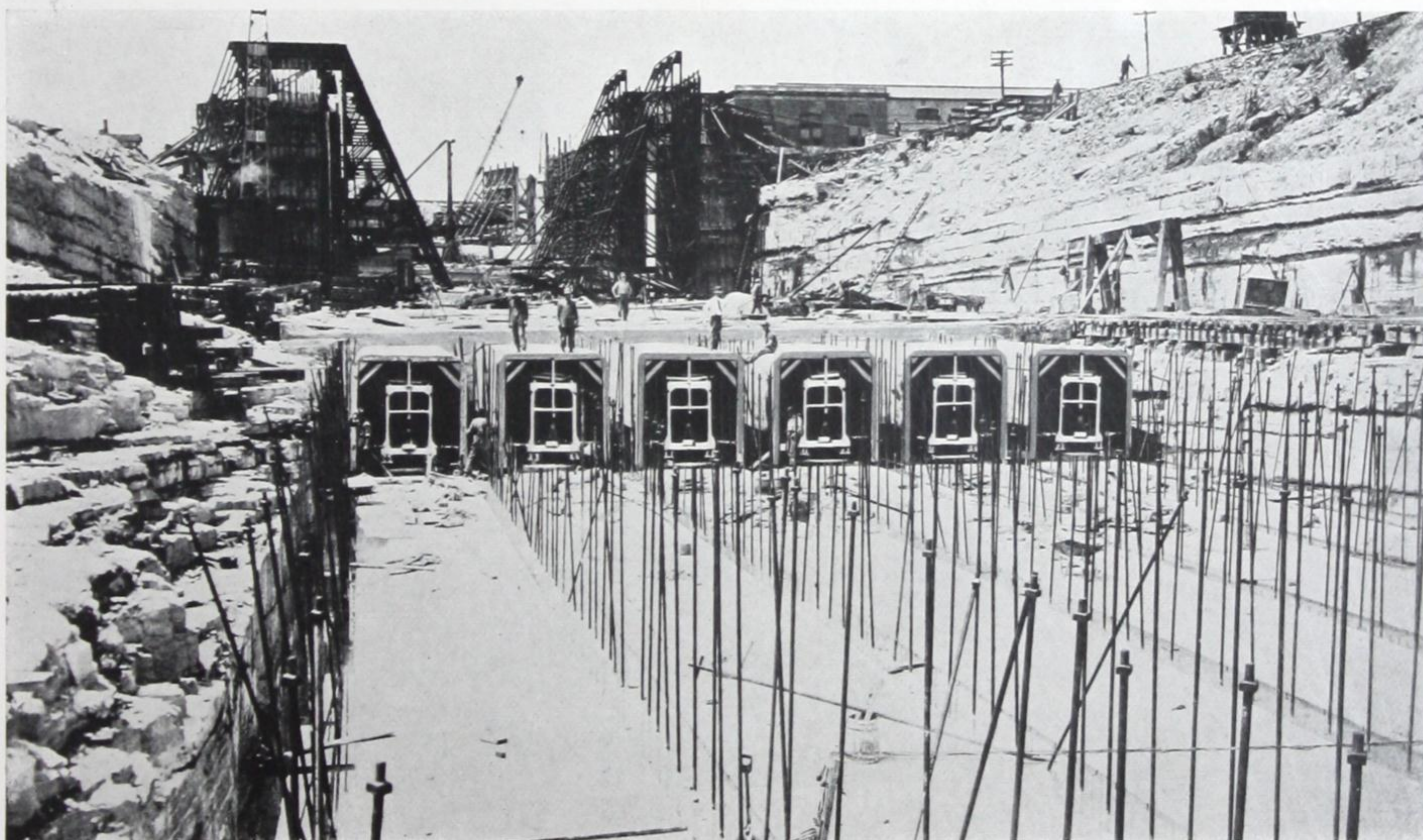


Blaw-Knox 12' x 7' 6" non-telescopic steel sewer forms adjustable to various widths. Note curbs cast integral with invert to facilitate setting of forms.  
 Brooklyn Sewers, Brooklyn, N. Y. Montrose Contracting Company, contractor.



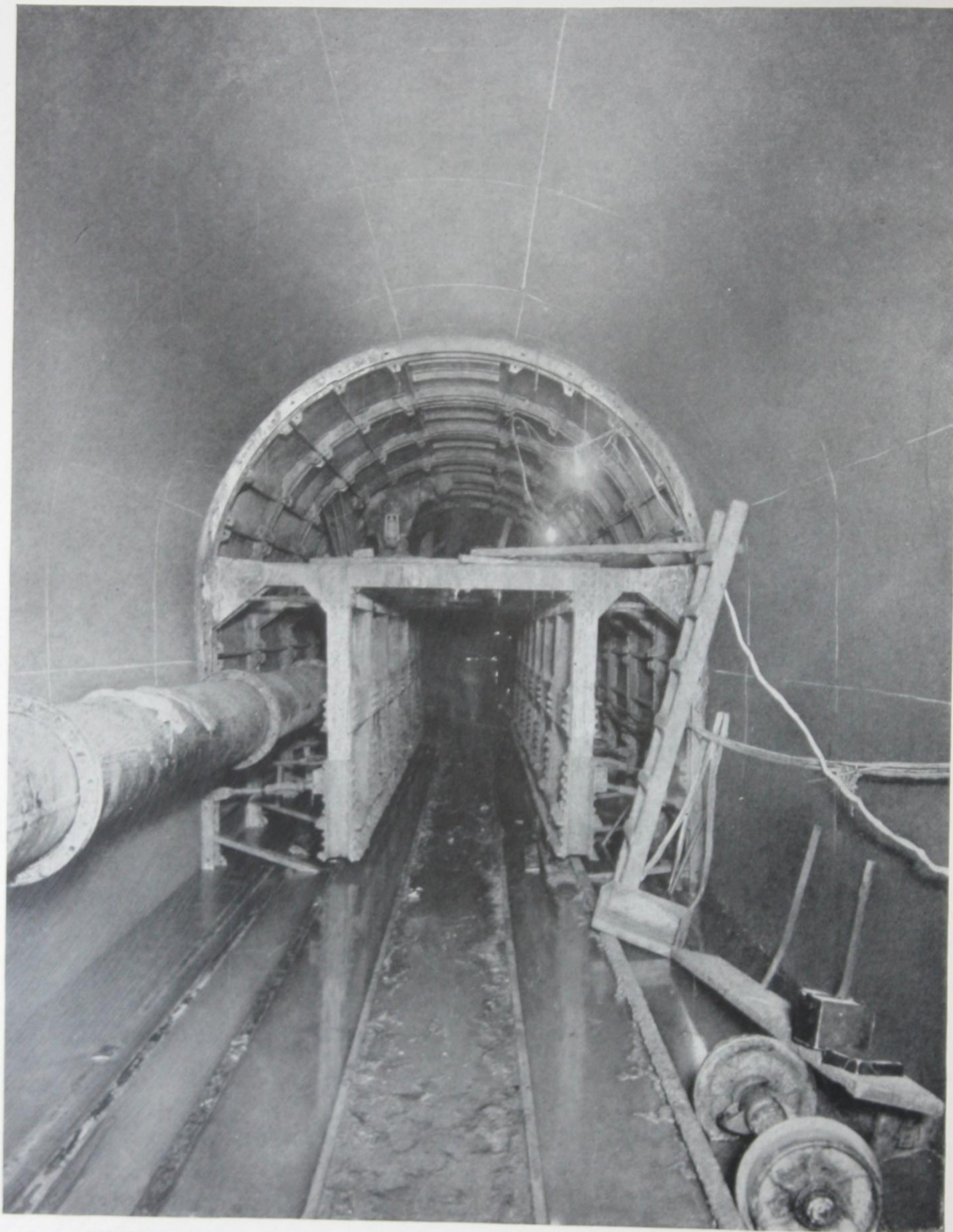


14' 6" x 9' 0" Blaw-Knox rectangular non-telescopic sewer forms. Adjustable to various sizes. Brooklyn Sewers, Brooklyn, N. Y., Necaro Company, contractor.



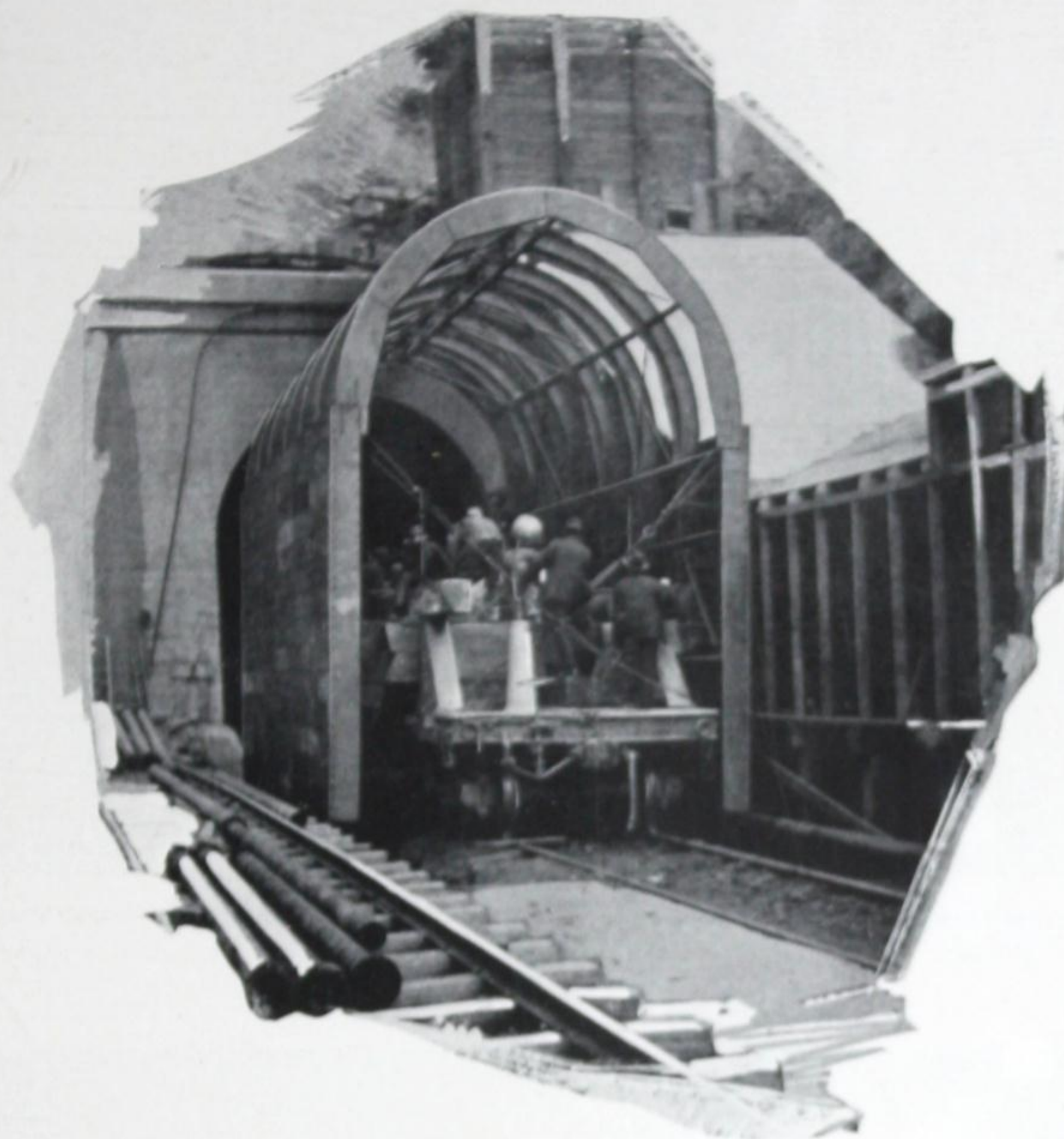
Blaw-Knox conduit forms used in connection with traveling wall forms shown on page 47. Soo Canal, St. Marys River, Sault Ste. Marie. Oscar Daniels Company, contractor.





12' x 12' Blaw-Knox traveling tunnel forms used in construction of Wilson Ave. Tunnel, City of Chicago. Note provision for concrete and muck car clearance, also arrangement for moving form without interference with pipe at side.





## Concrete Lined Tunnels

**B**LAW-KNOX Steel Tunnel Forms are contributing factors of great value to the completion of tunnel work in record time and at low cost. Practically every important tunnel constructed in the United States during the last twenty-three years has been Blawformed. This constitutes not only a record of achievement, but a display of confidence on the part of hundreds of contractors in the intimate knowledge of job conditions possessed by the Blaw-Knox engineering staff and in the company's design and manufacture of steel forms to exactly meet contractors' plans.

Owing to the great variety of tunnel work and the many different modes of construction, a special study is made of each job to provide proper form equipment.

Blaw-Knox Steel Tunnel Forms are made for handling with mechanical travelers or for hand handling; many jobs also require that traffic be maintained during concreting operations. Blaw-Knox Forms are designed for tunnels of any character, including sub-aqueous work, hard rock or work requiring a shield.



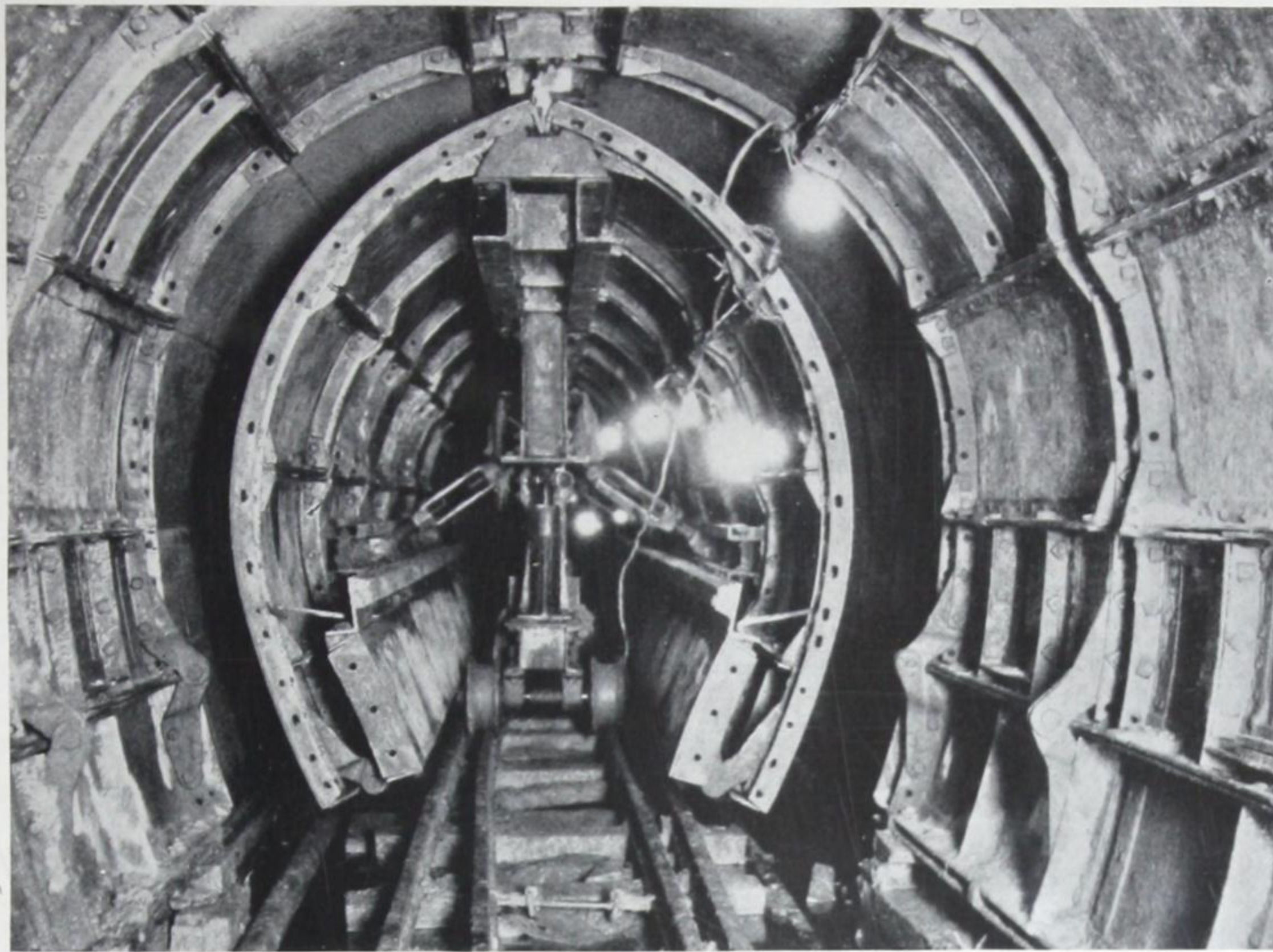


Standard design of small diameter, knocked down, hand handled Blaw-Knox tunnel forms. This equipment consists of steel ribs and steel lagging placed as concrete progresses. Note entire diameter of tunnel is clear for working.

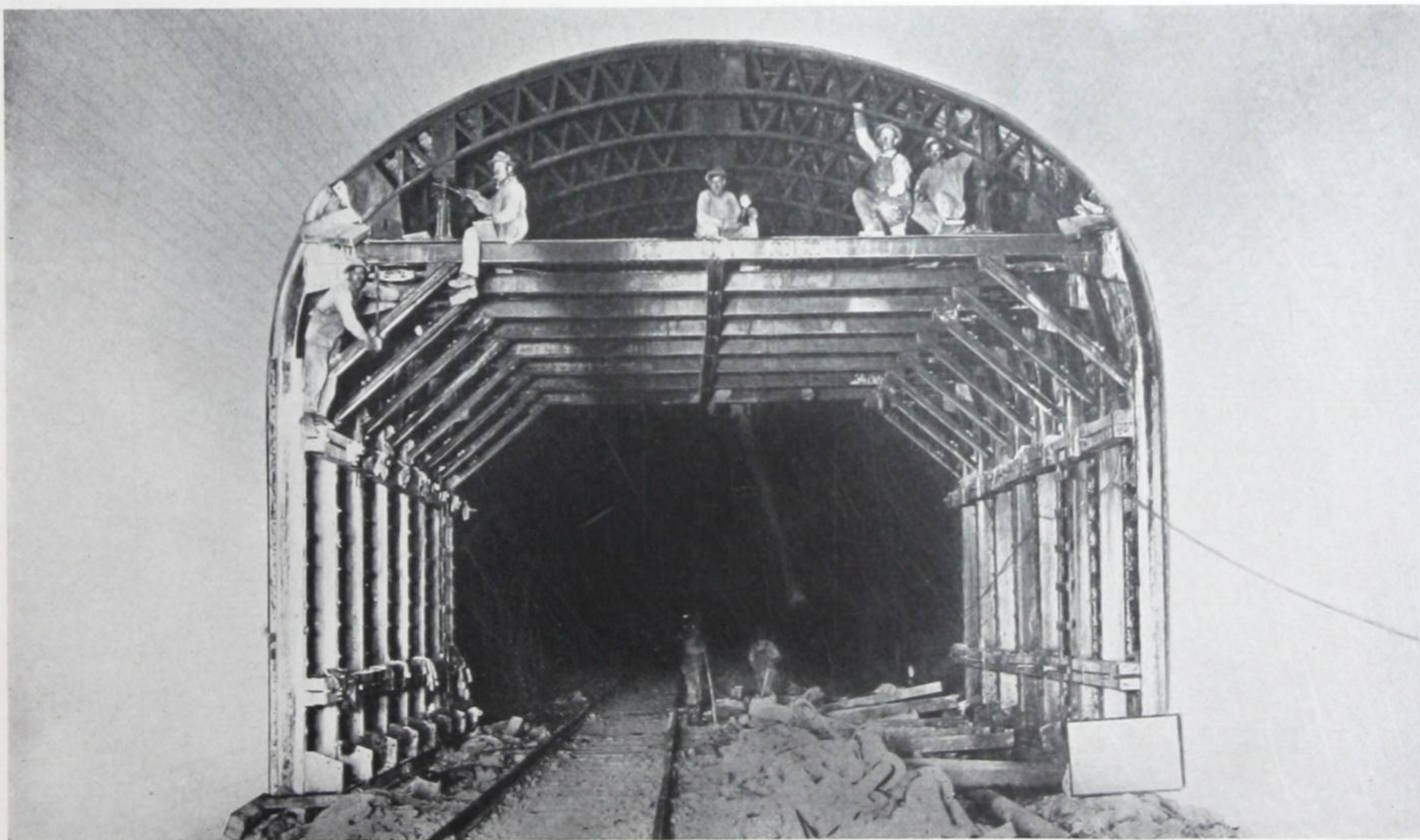


Liberty Tunnel, Pittsburgh, Pa. Booth and Flinn, Inc., contractors. Traveling crown forms on vehicular tunnel 26' 6" x 22'. Note maximum amount of clearance for mucking and concreting equipment to pass through forms. Steel sidewall forms were used with incline for concrete cars to run up on platform from which sidewalls were poured. A Ransome concrete gun was used on crown.



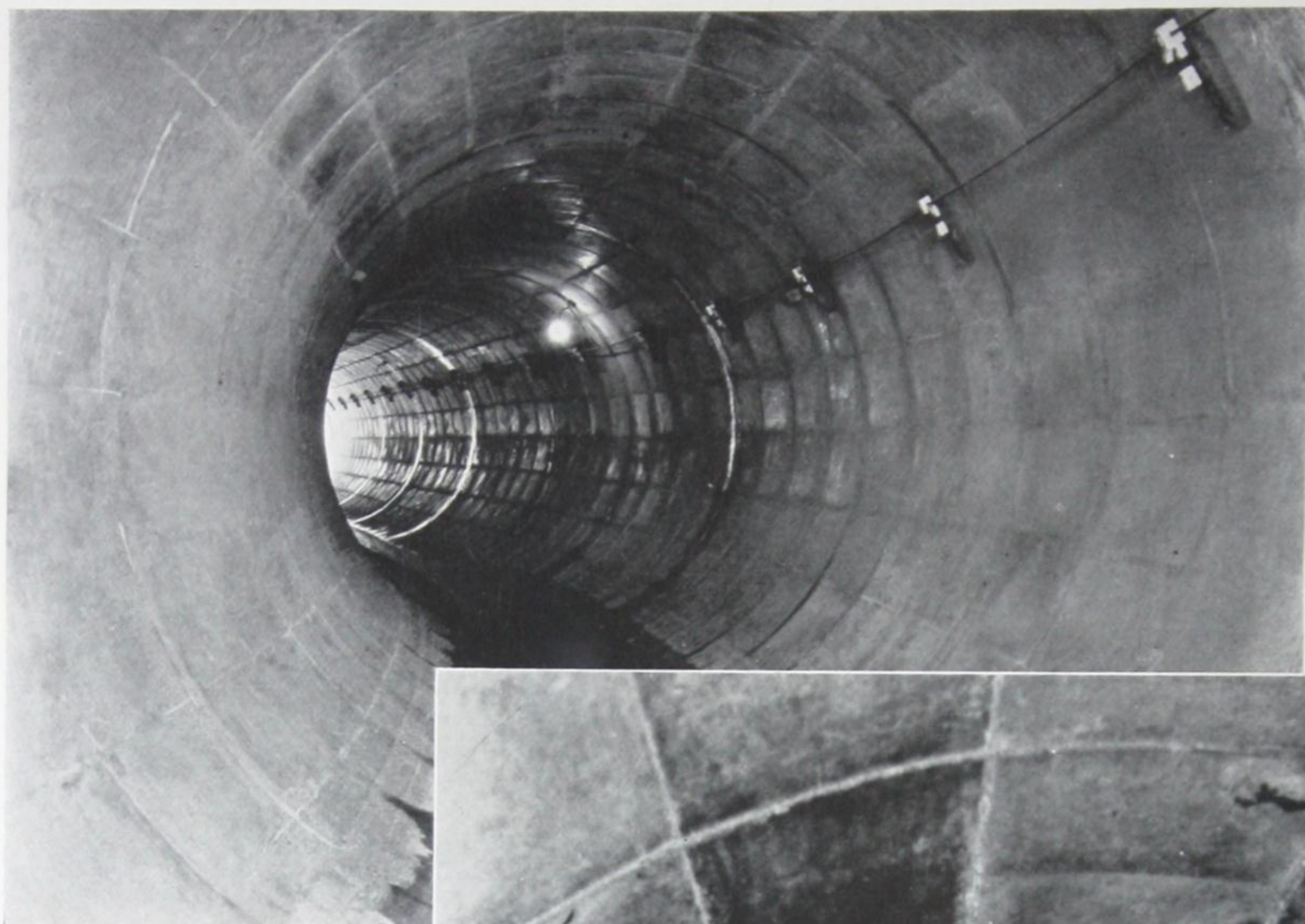


Blaw-Knox 10' horseshoe tunnel form of telescopic design used by Siems & Carlson, St. Paul, Minn., in the construction of the Wynoochee Tunnel at Aberdeen, Washington. See letter on page 107.



Double track Blaw-Knox Tunnel Form used in the construction of the Sand Patch Tunnel of the Baltimore and Ohio Railroad. Note clearance to maintain traffic during construction.



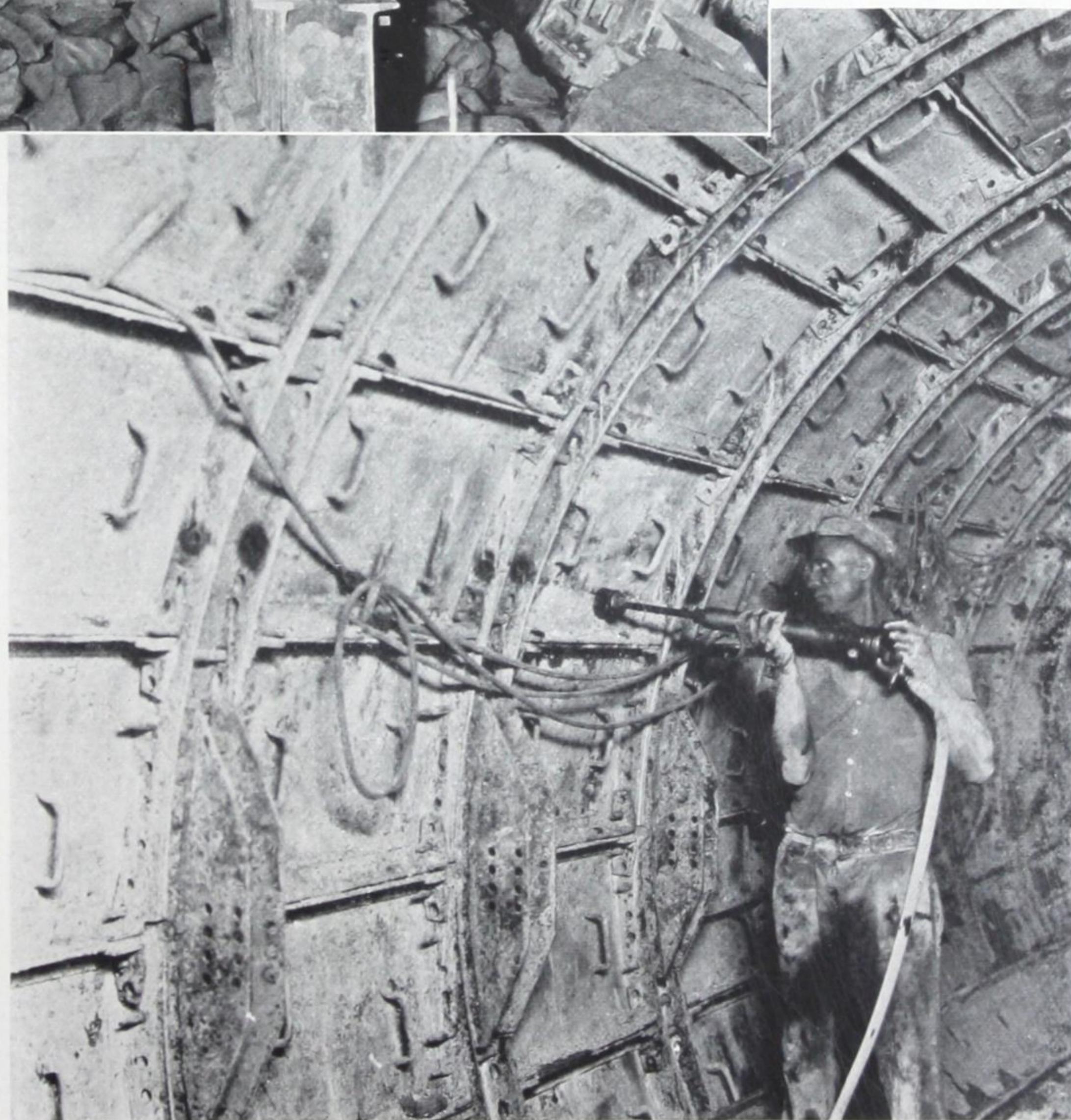
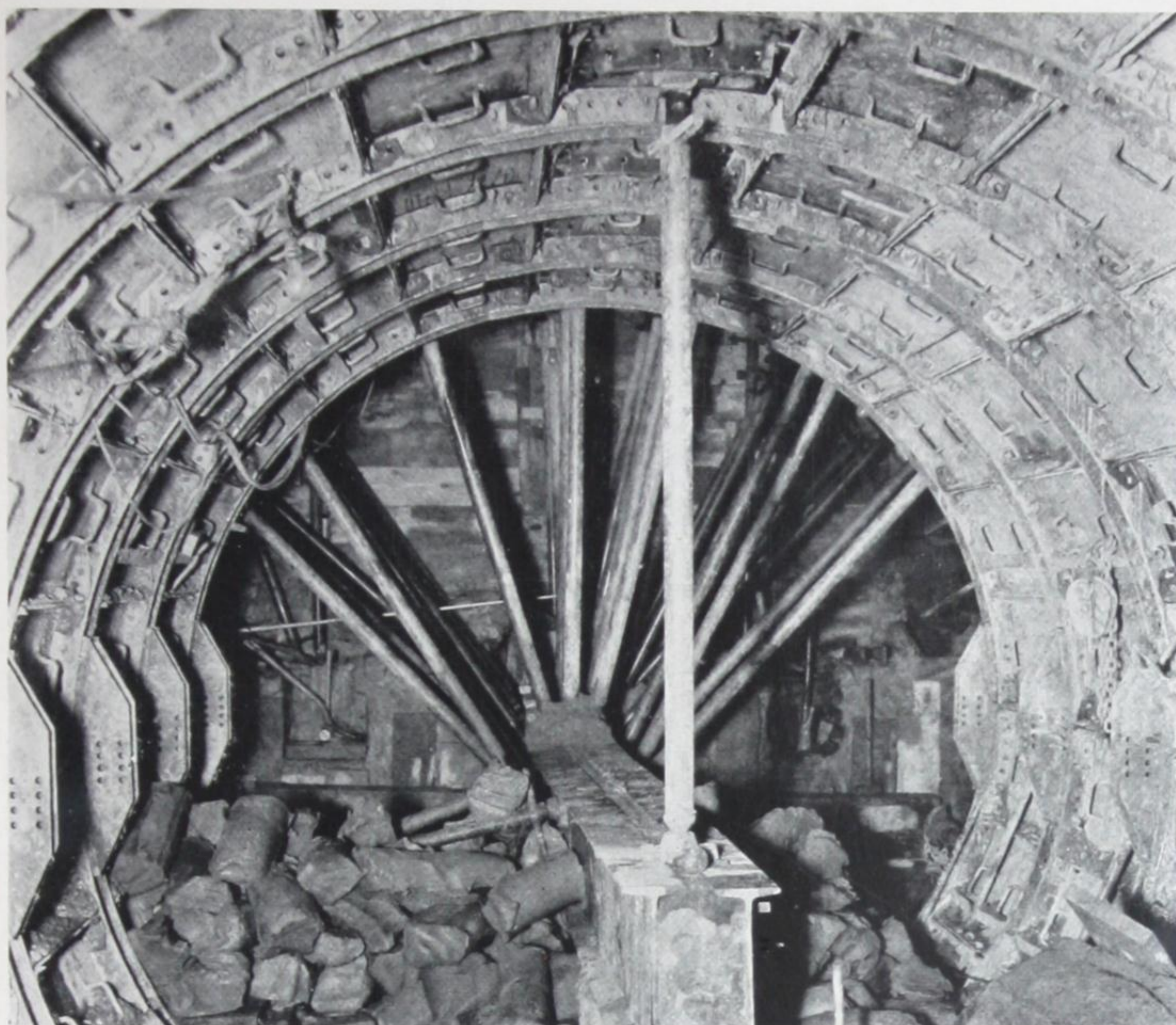


Springwells Water Tunnel,  
Detroit, Mich., 14' diameter.  
Upper view shows finished  
work on curve. Lower view  
illustrates general method of  
use of needle beam.



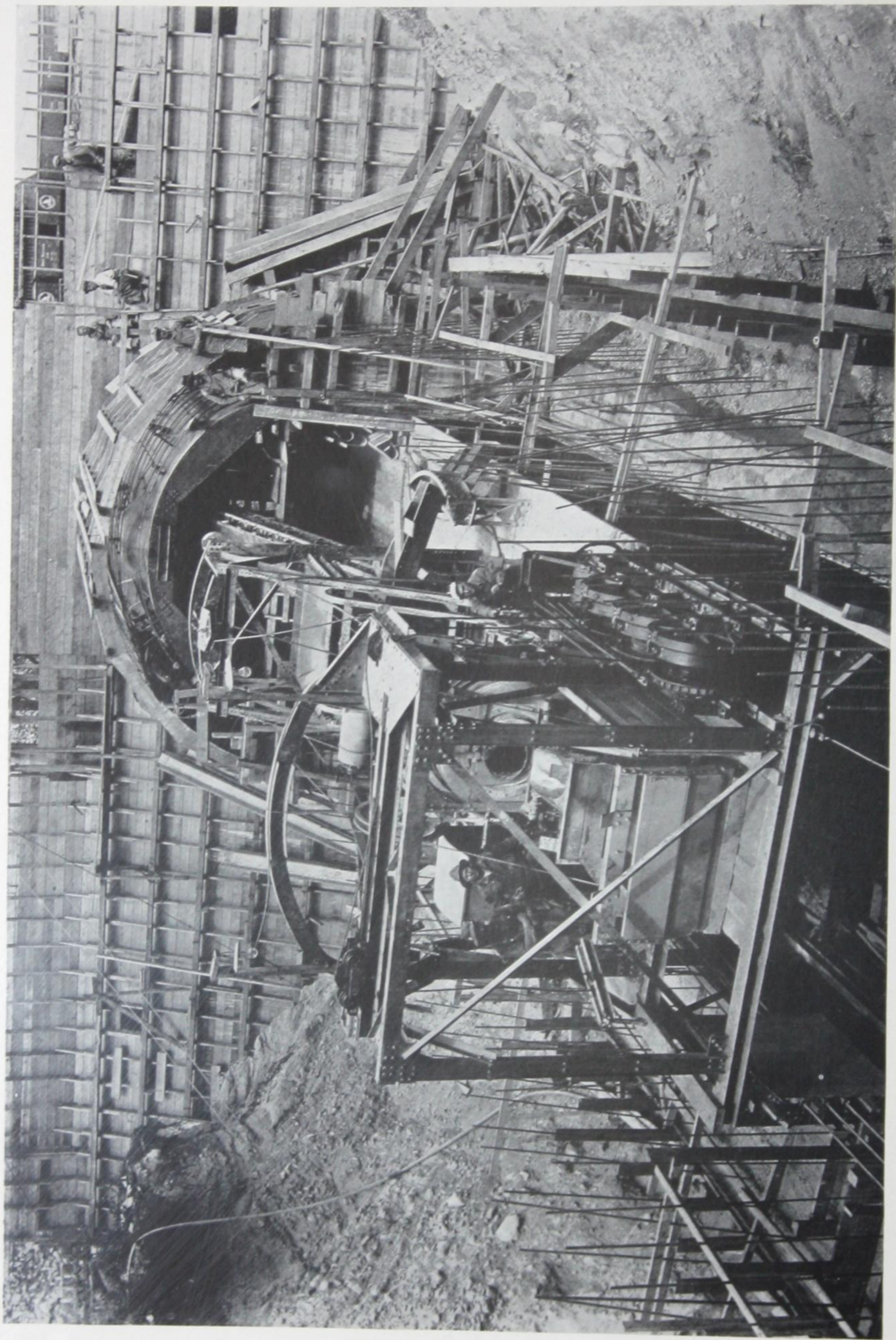
More views of  
wells Water T  
tract, Mark  
Co., contract  
34 and letter c





More views of the Springwells Water Tunnel Contract, Mark R. Hanna Co., contractor. See page 34 and letter on page 111.



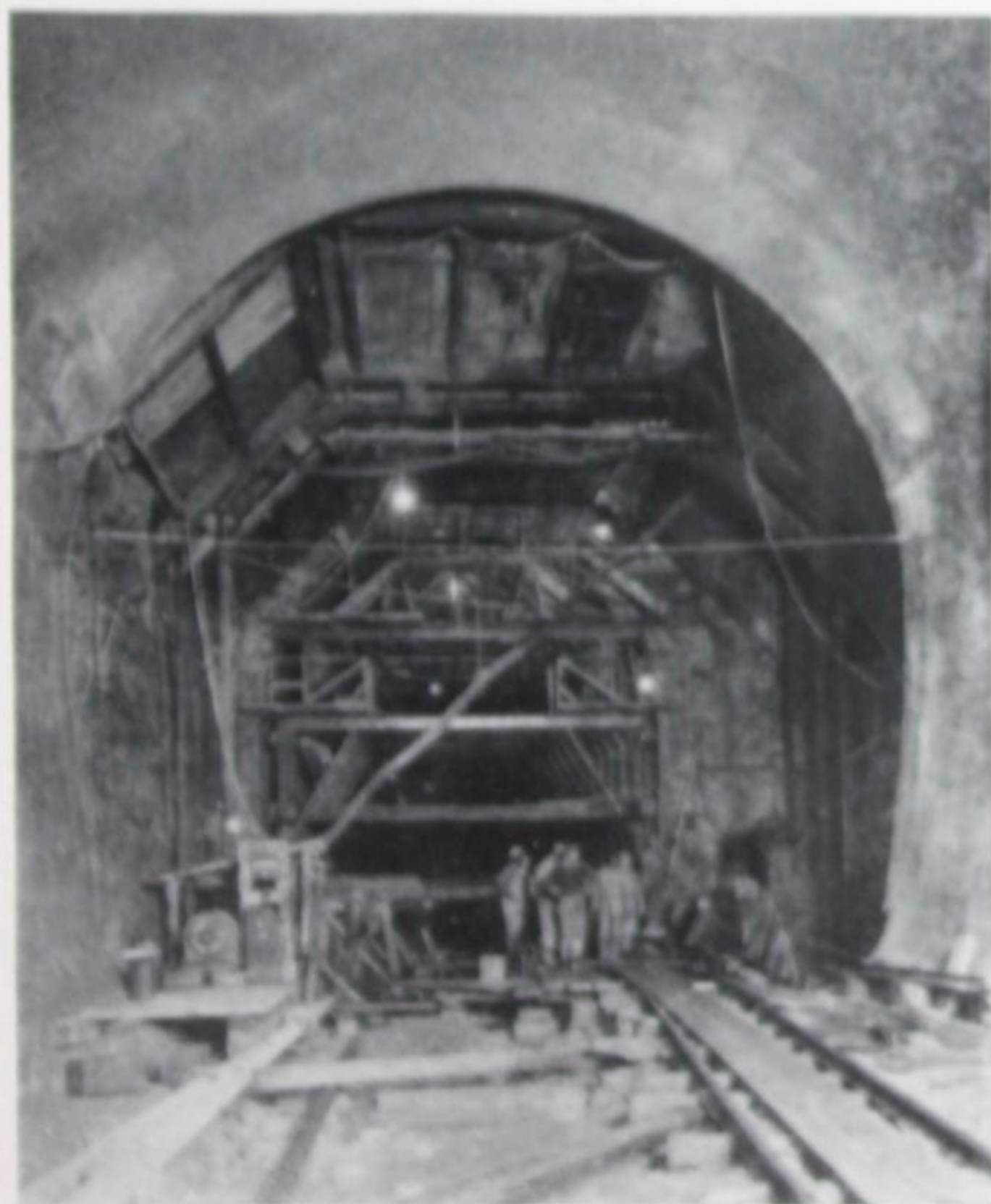


Blaw-Knox steel tunnel forms and traveler used by A. Guthrie & Co., in forming concrete lining for Cascade Tunnel, Great Northern R. R. These forms were used in the construction of eight miles of work and the concreting was completed in twenty-six months. Note: Form traveler designed to carry entire mixing and placing plant and Ransome gun. See letter from Mr. J. C. Baxter, vice-president, A. Guthrie & Co., Inc., on page 110, about the form problems on this job and their solution.





Section I Springwells Water Tunnel, Detroit, Mich., George R. Cooke, contractor. Blaw-Knox 12' diam. tunnel forms with removable plates for placing concrete by hand.

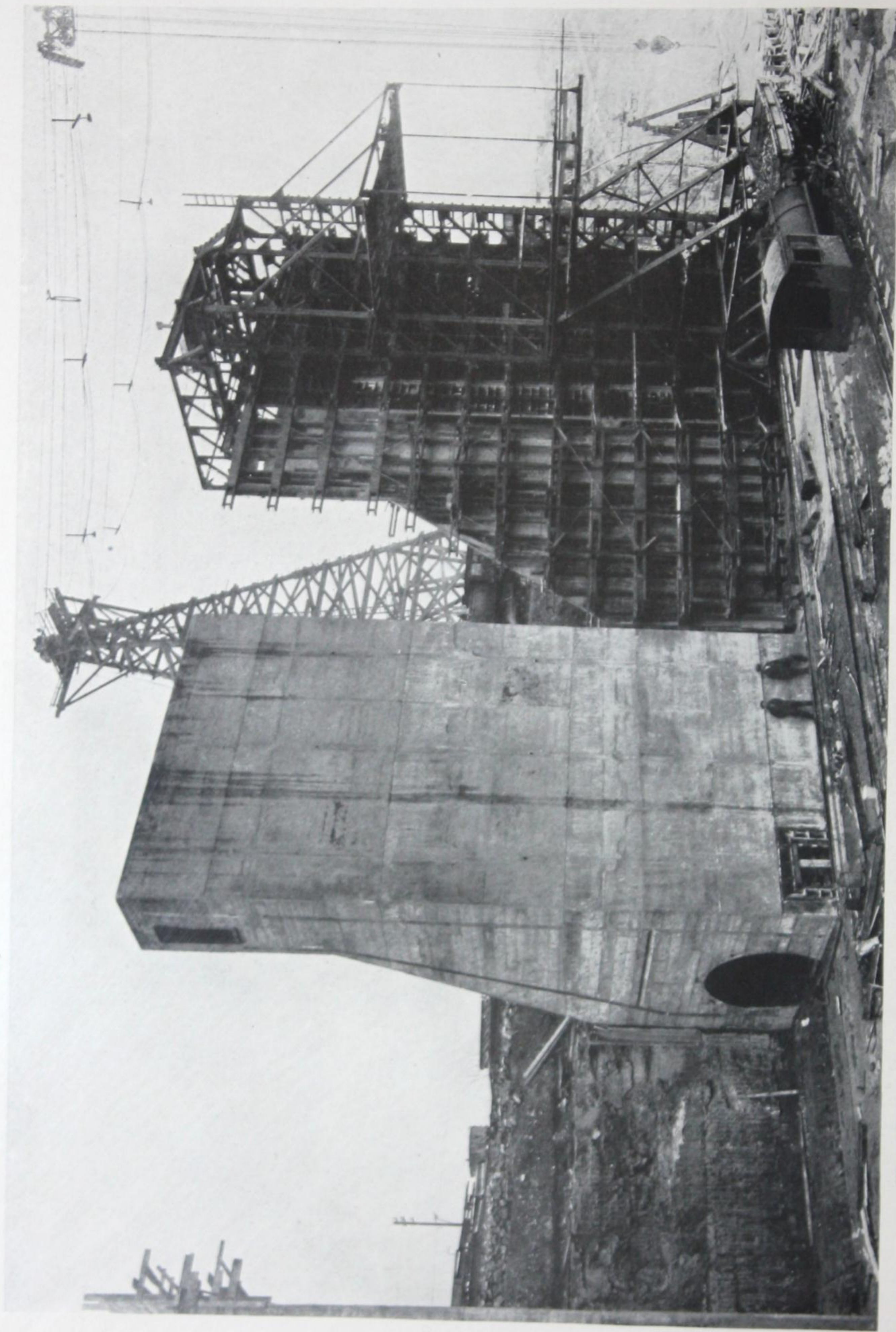


Blaw-Knox traveling steel tunnel forms for 32' horseshoe section. Job worked from two shafts with two 25' sections of forms. Concrete placed by pneumatic method. Niagara Falls Power Company, Niagara Falls, N. Y.



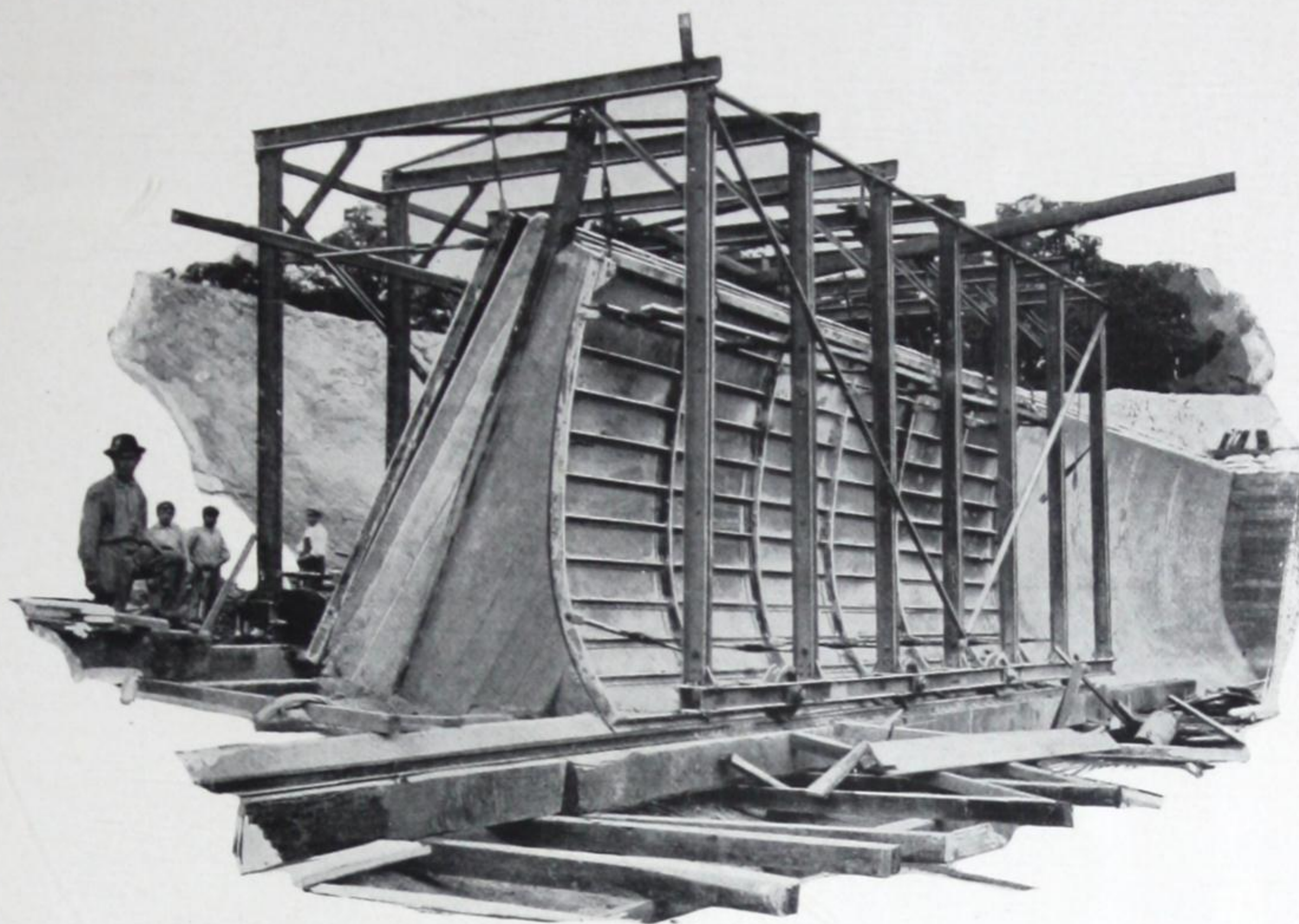
Ville Emard Collecting Sewer, Montreal, Canada. Atlas Construction Co., contractor. Blaw-Knox 19' horseshoe shaped, telescopic, steel tunnel forms.





Illinois Waterway Lock, Lockport, Ill. Green & Sons Company, contractor. Blaw-Knox traveling steel wall form 61' high with rectangular and circular conduits. Note hinged bulkheads. Wall was poured in alternate blocks using one 30' unit of forms with bulkheads and one 30' unit without bulkheads.



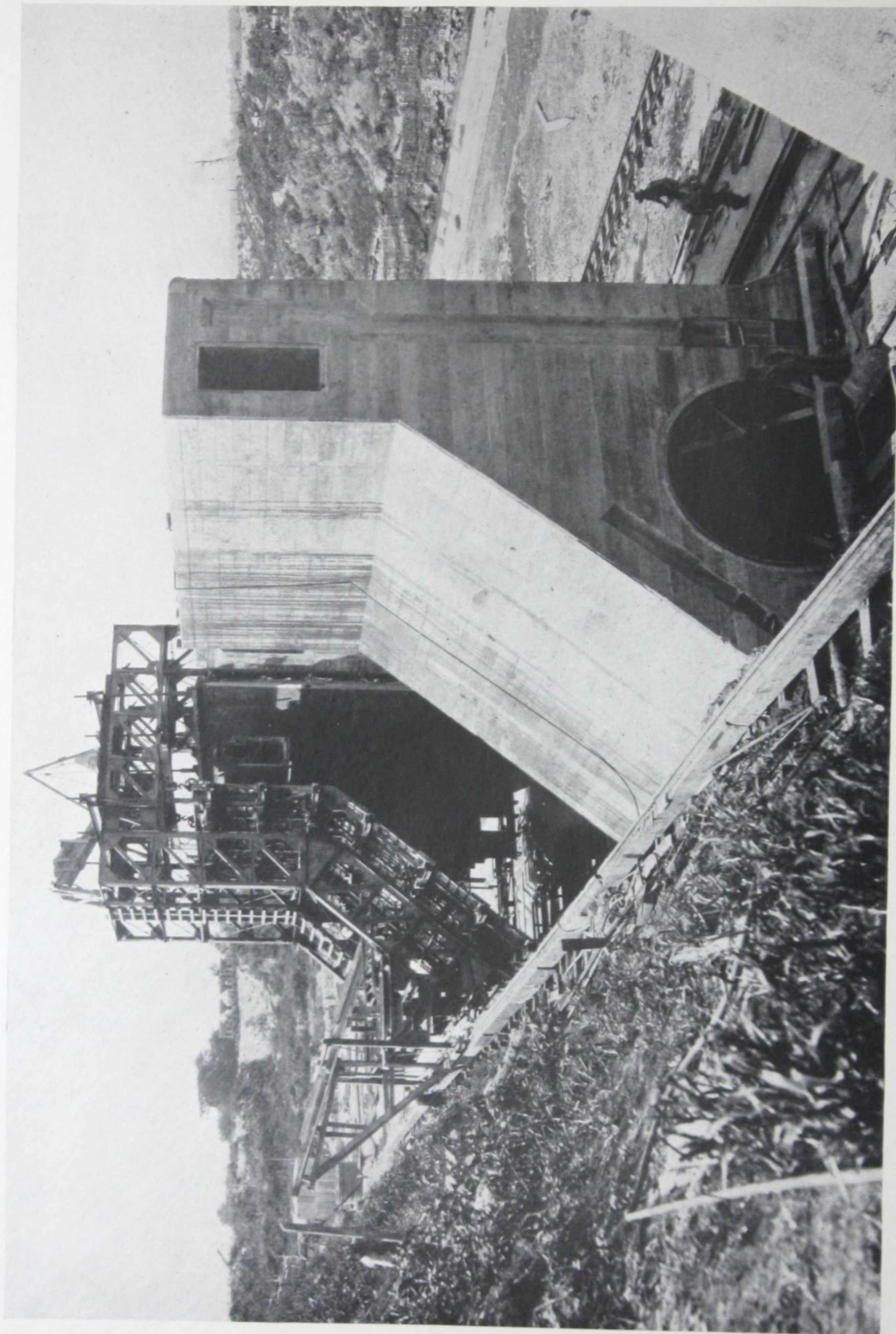


## Concrete Walls

**T**HE subject of Blaw-Knox Forms for concrete walls has been divided into two sections: This section illustrates examples of construction utilizing forms of the traveling type; the following section is descriptive of classes of work on which standard panel forms and accessories can be used to advantage.

The wide experience of the Blaw-Knox Company in the design, manufacture and use of steel forms for the construction of walls of every type, forms a valuable advisory service for any contractor who has a job or is bidding on construction of this character.



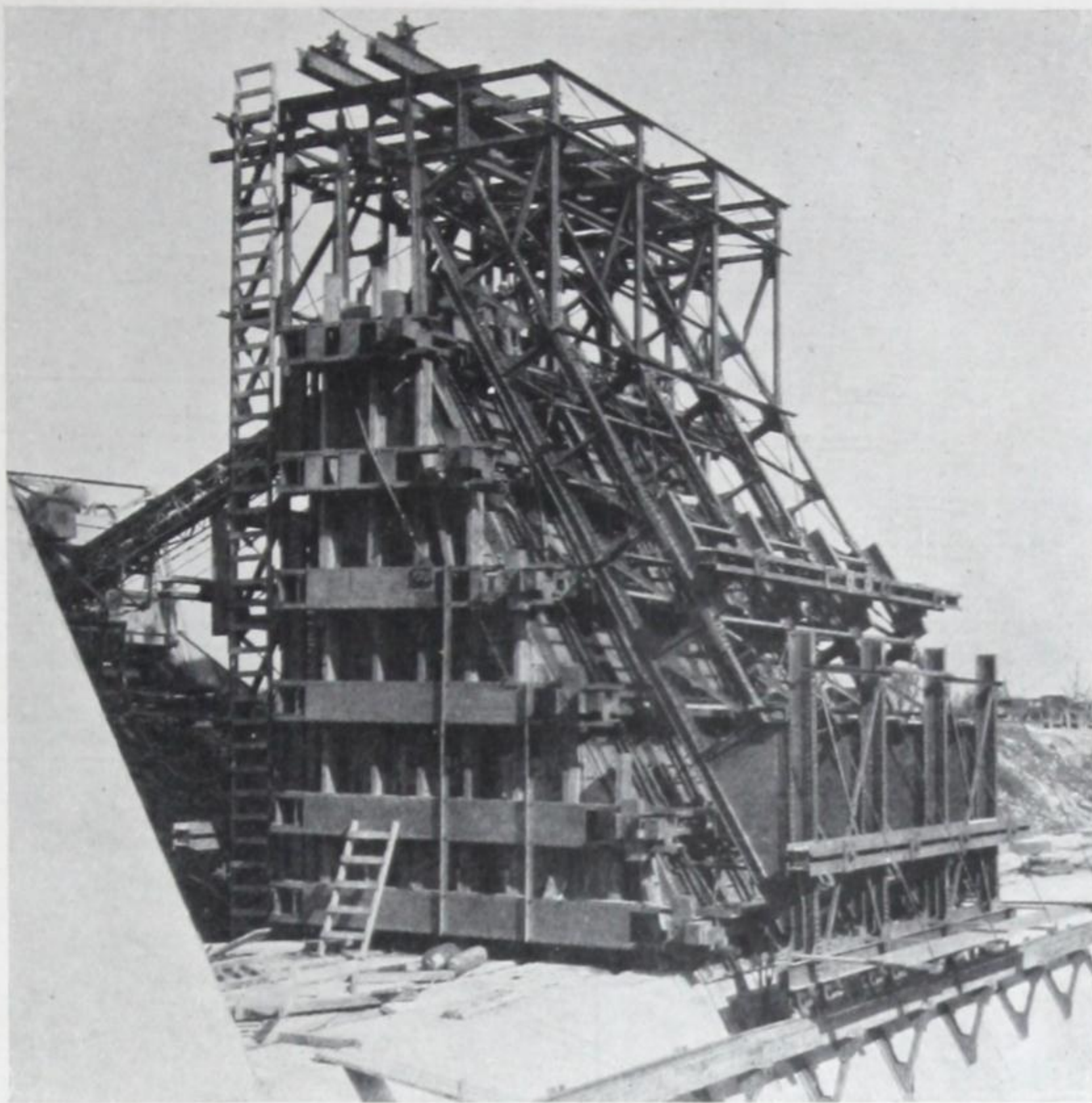


Blaw-Knox traveling steel wall form 39' high used by Woods Bros. Construction Co., Inc., on Illinois Waterways Lock, Starved Rock, Ill. Approximately 600 lineal feet of wall was built on this job, each pour being about 600 cu. yds. See letter from Wayne Pringle, Chief Engineer, page 108.

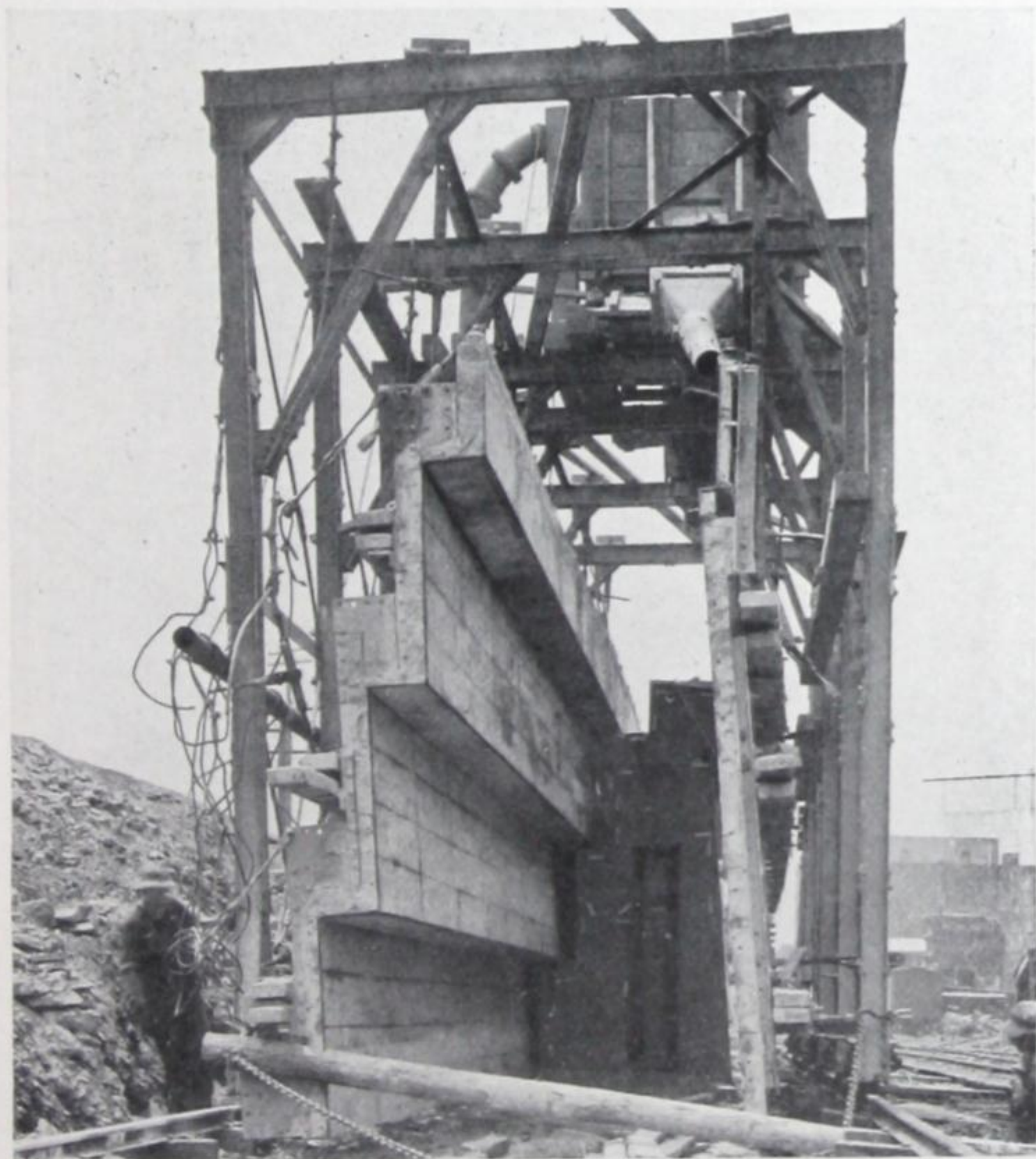


Step retaining  
traveling form

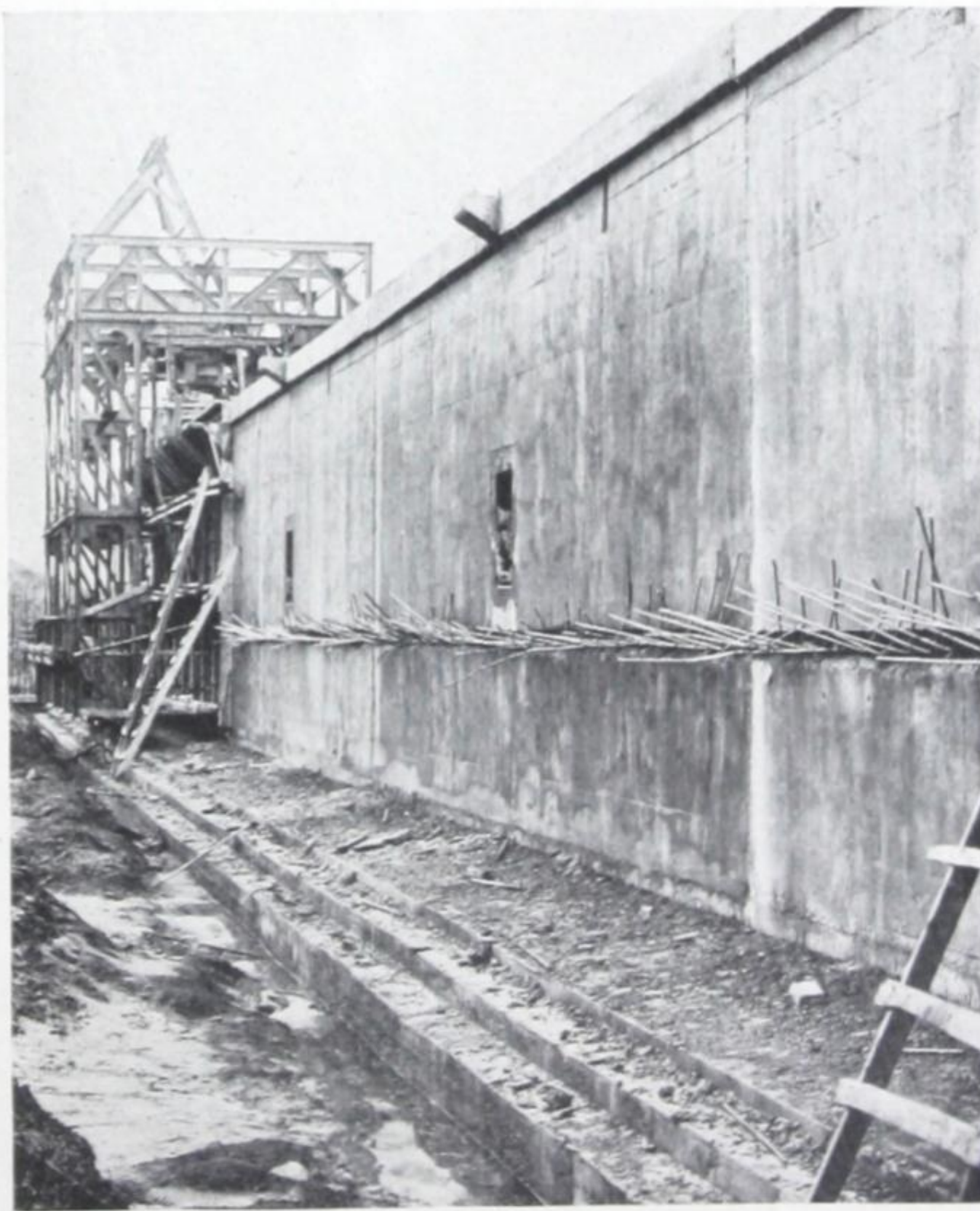




Blaw-Knox traveling steel forms with hinged bulkheads. Height varied from 14' minimum to 27' maximum. Several miles of this wall were constructed with four 30' units of form. Illinois Waterways Sea Wall. Green & Sons Company, contractor.

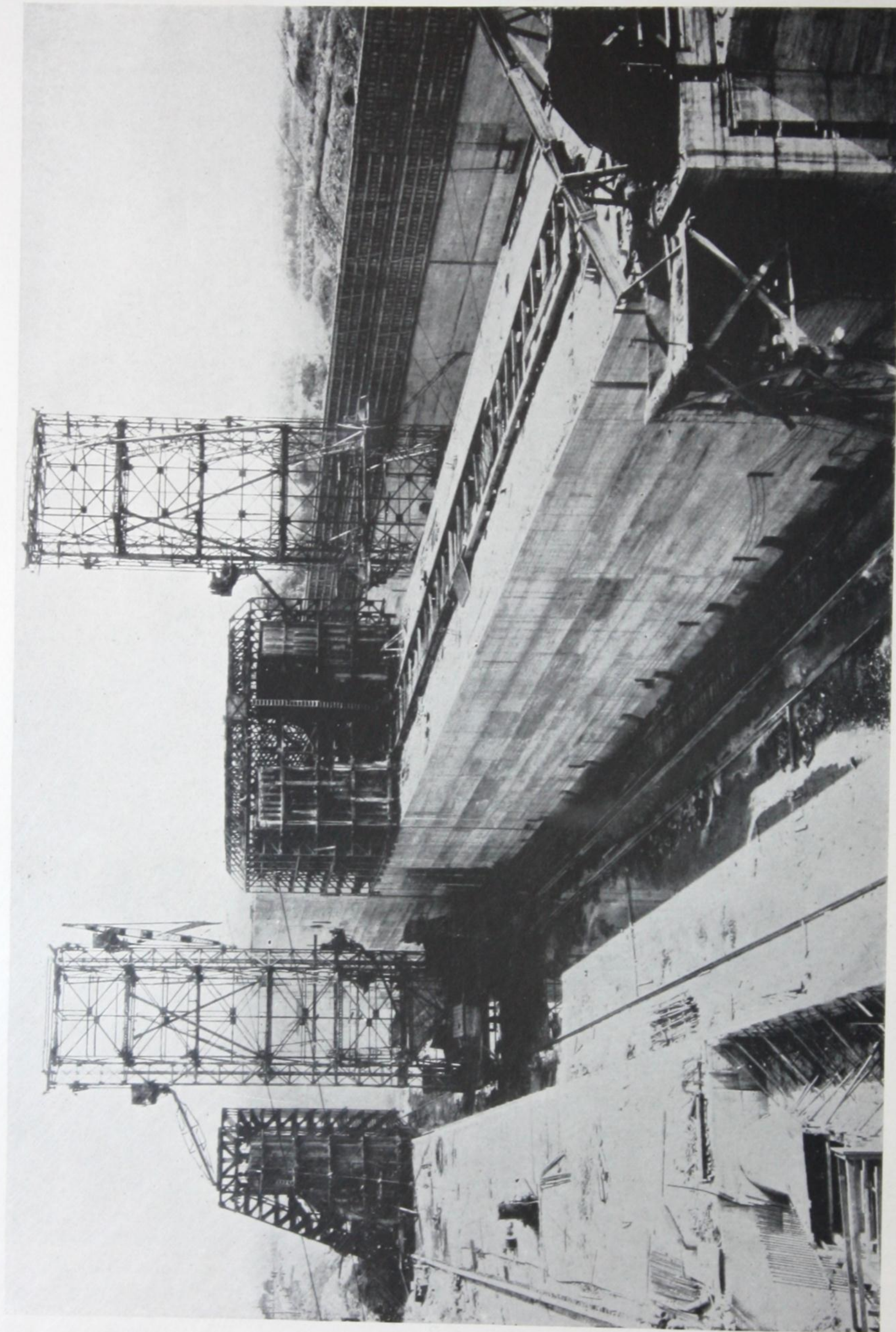


Step retaining wall, B. & O. R. R., Pittsburgh, Pa. Blaw-Knox traveling form with special arrangement for placing concrete.



Blaw-Knox traveling steel forms with skip hoist for placing concrete. Note corbels, valve openings and dowels built in the wall which was 17' 3" high. St. Louis Water Works, St. Louis, Mo. Missouri Engineering Co., contractor.





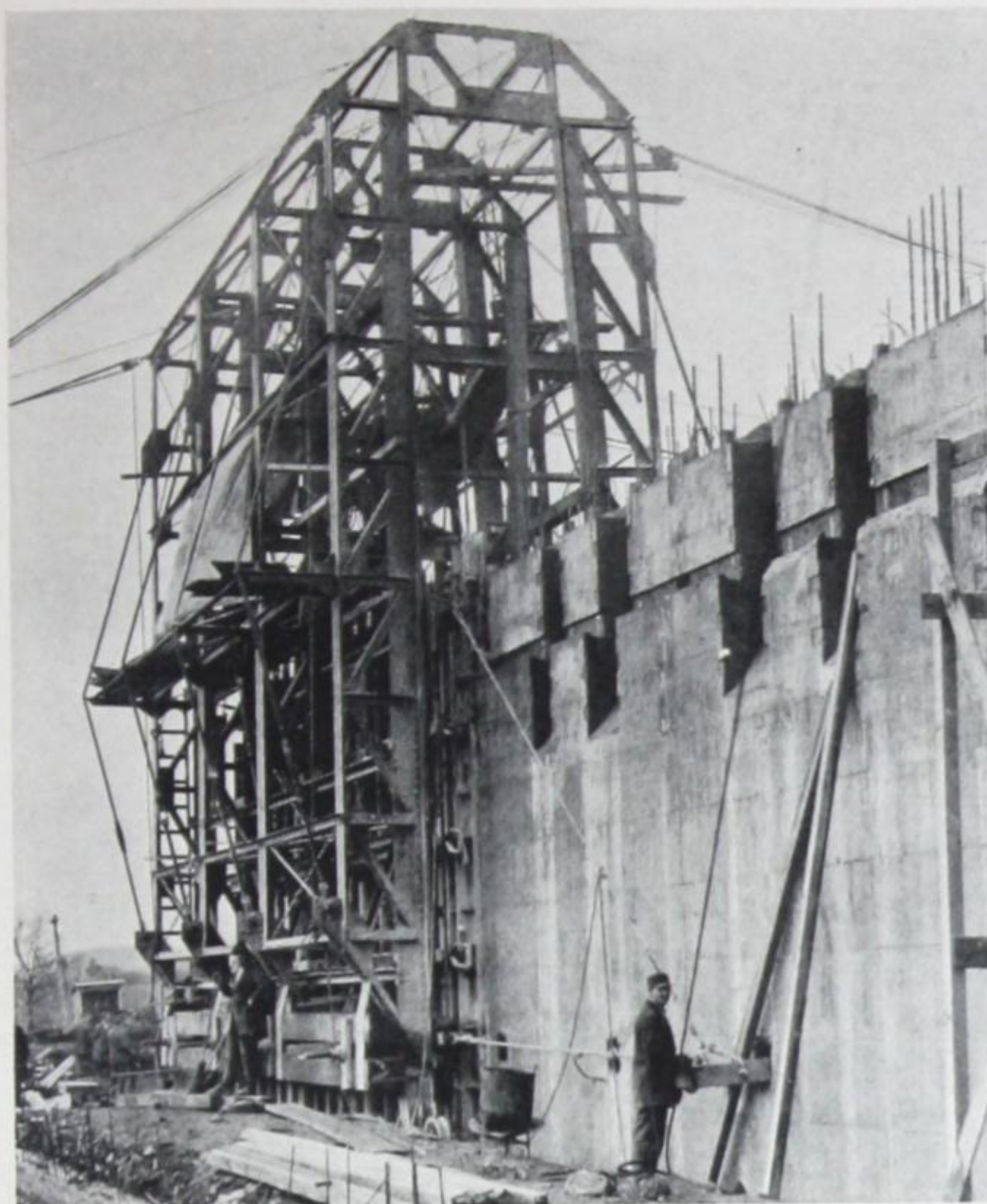
Welland Ship Canal, St. Catherine, Ontario, Canada. P. Lyall & Sons Construction Company, contractor. Form shown on right of photograph is a Blaw-Knox double wall form 65' x 60' x 60'. Each wall form was supported by trusses which cantilevered from traveler running on a track between the two walls. On each side of this double center wall is a single wall having approximately the same dimensions as one of the center double walls.



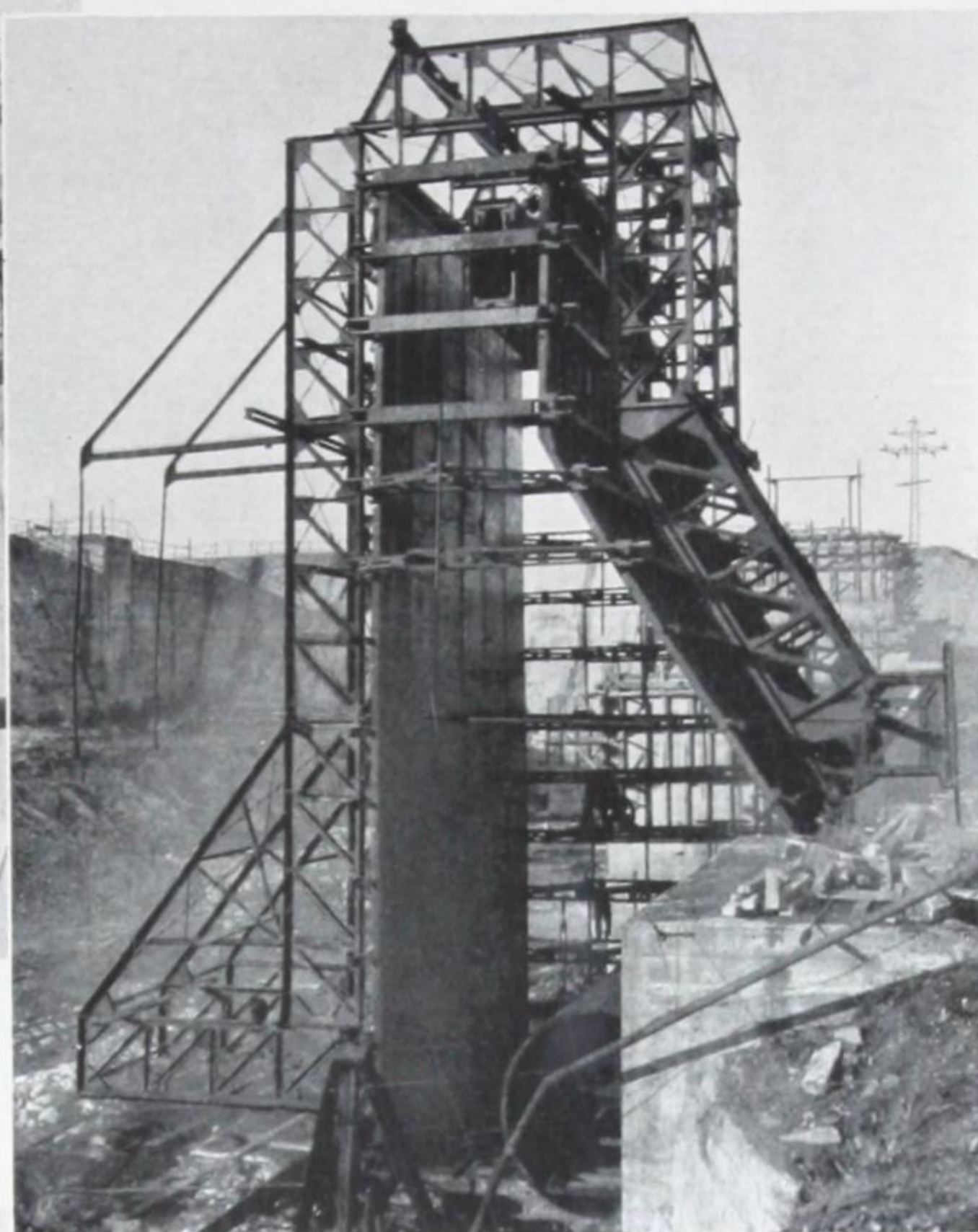
Right:  
Louis,  
Compe  
graph  
descri





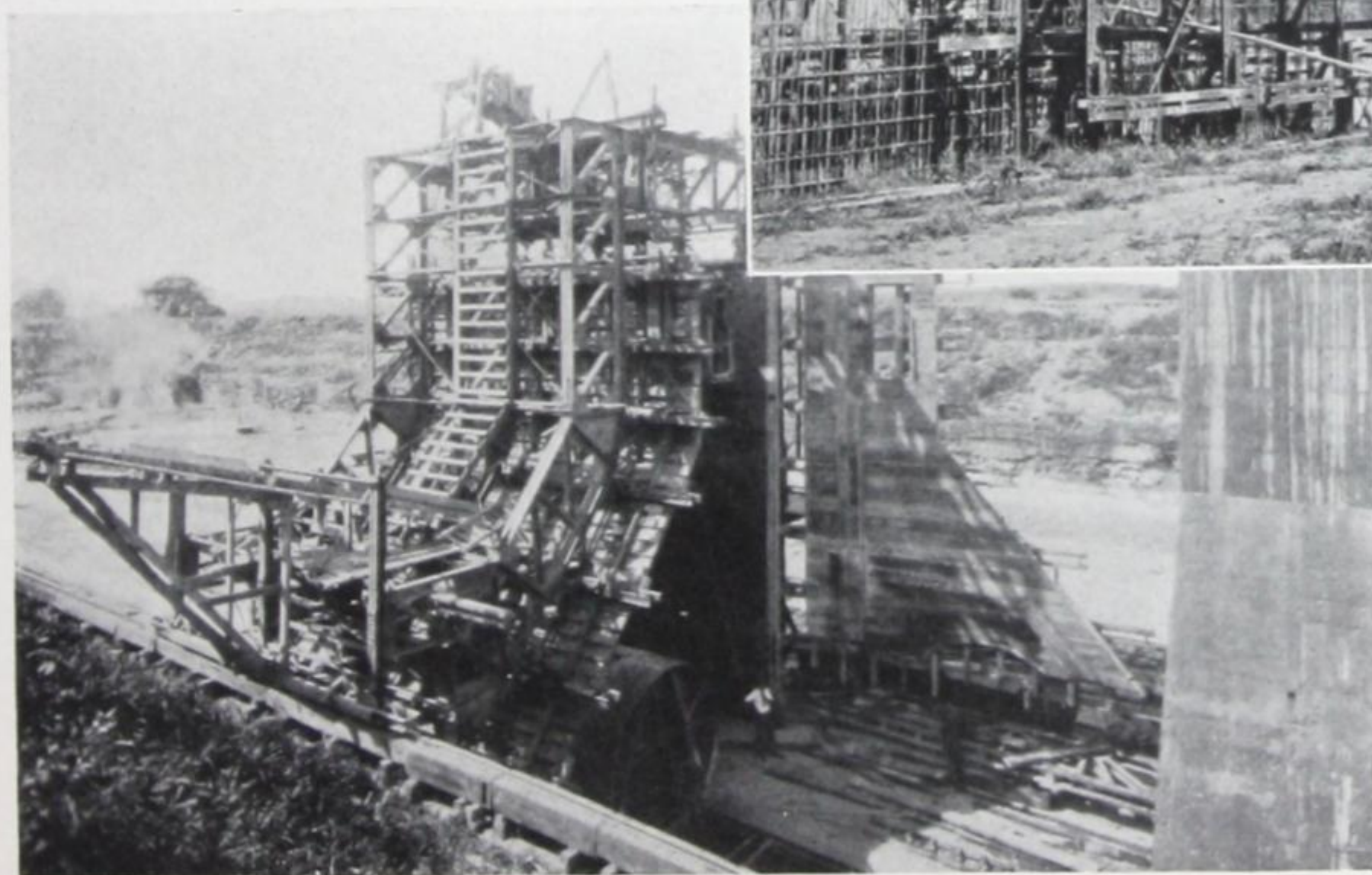
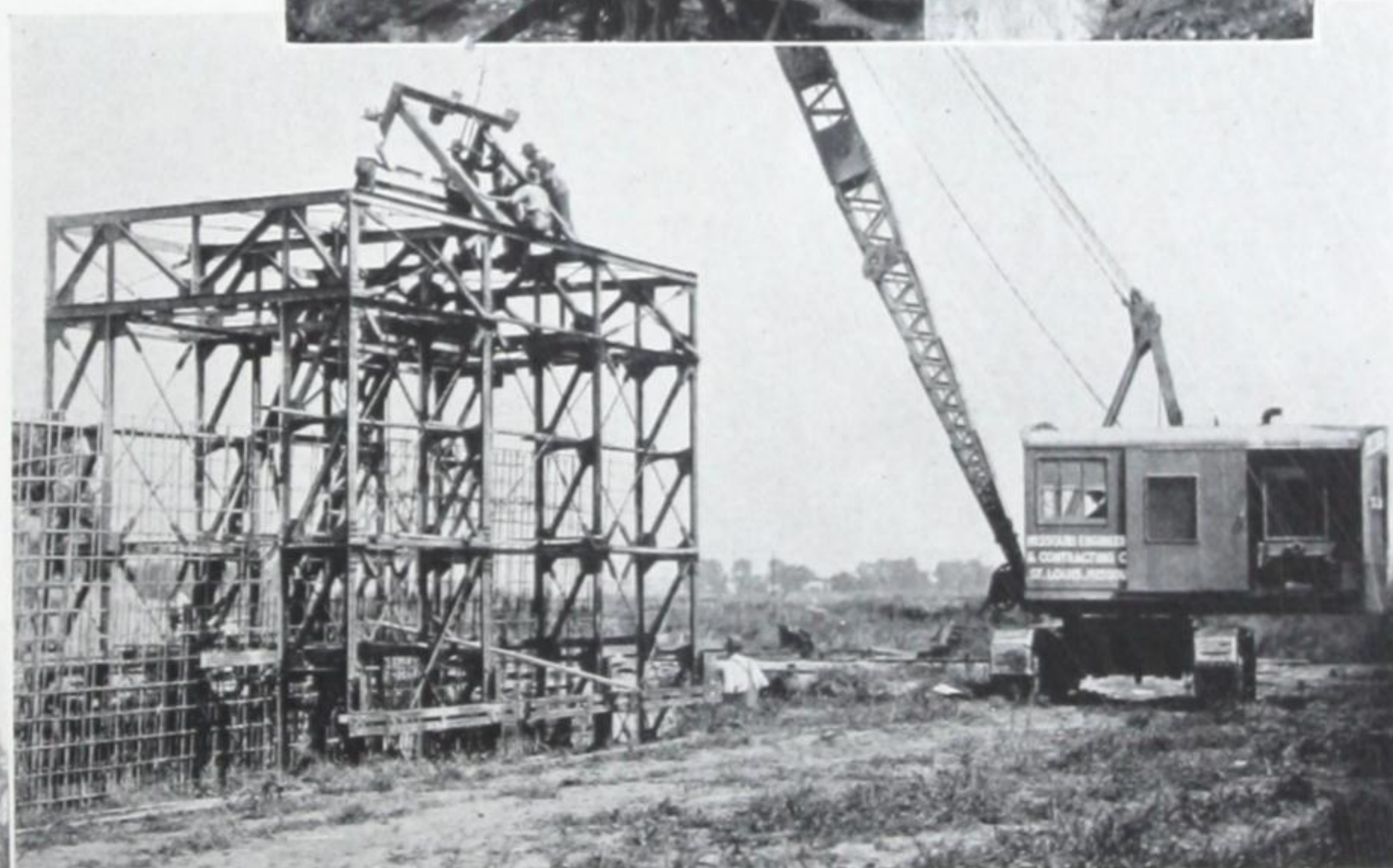


Left: Blaw-Knox traveling steel wall forms 40' high. A very special type of form due to the many adjustments necessary to fulfill specifications. Blaw-Knox steel forms were also used for the cells in the main building. New Western Penitentiary of Pa., Rockview, Pa. W. T. Grange Construction Company, contractor.



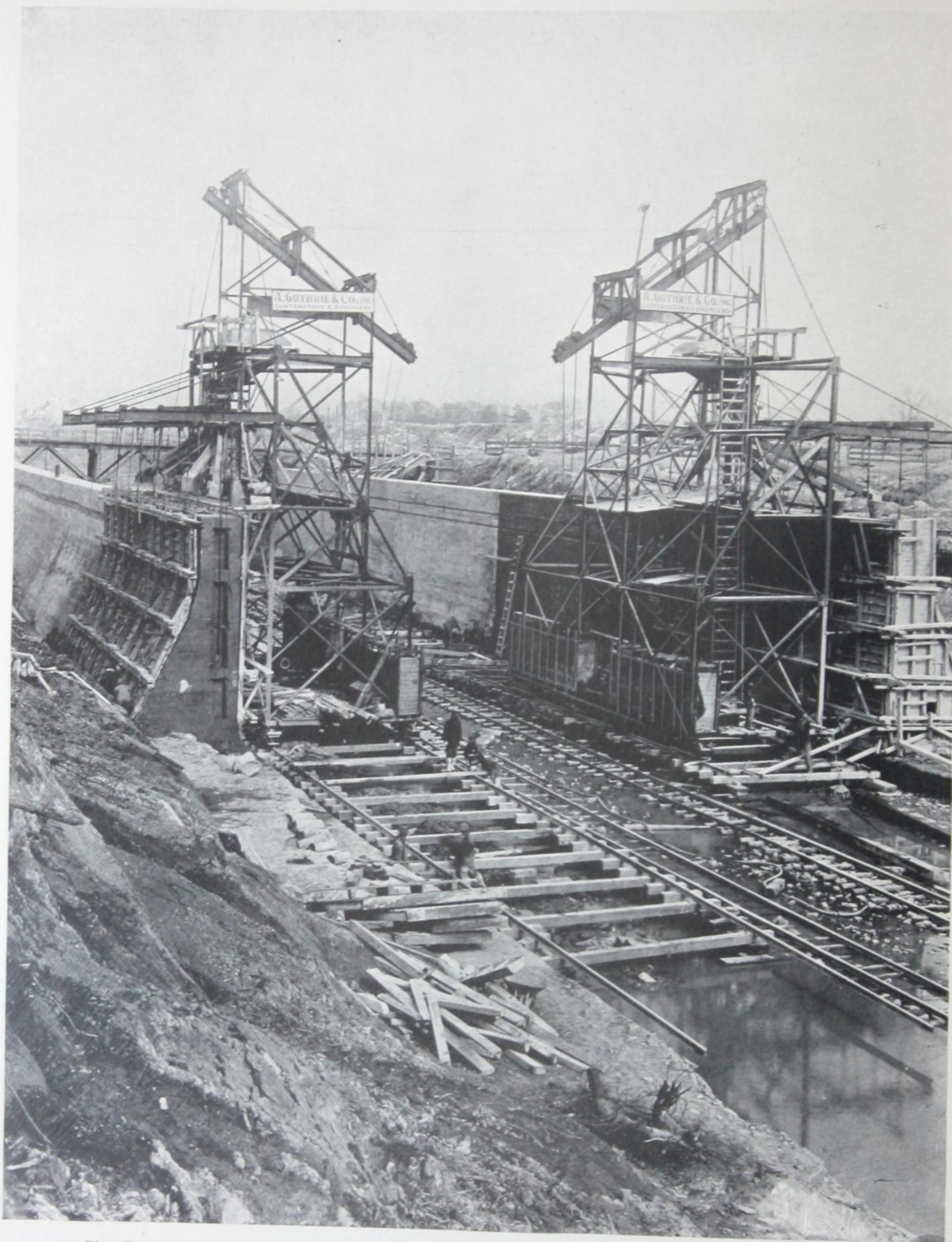
Right: Illinois Waterways Lock, Lockport, Ill. Green & Sons Company, contractor.

Right: St. Louis Waterworks, St. Louis, Mo. Missouri Engineering Company, contractor. This photograph shows the erection of forms described on page 41. Note skip hoist arrangement.



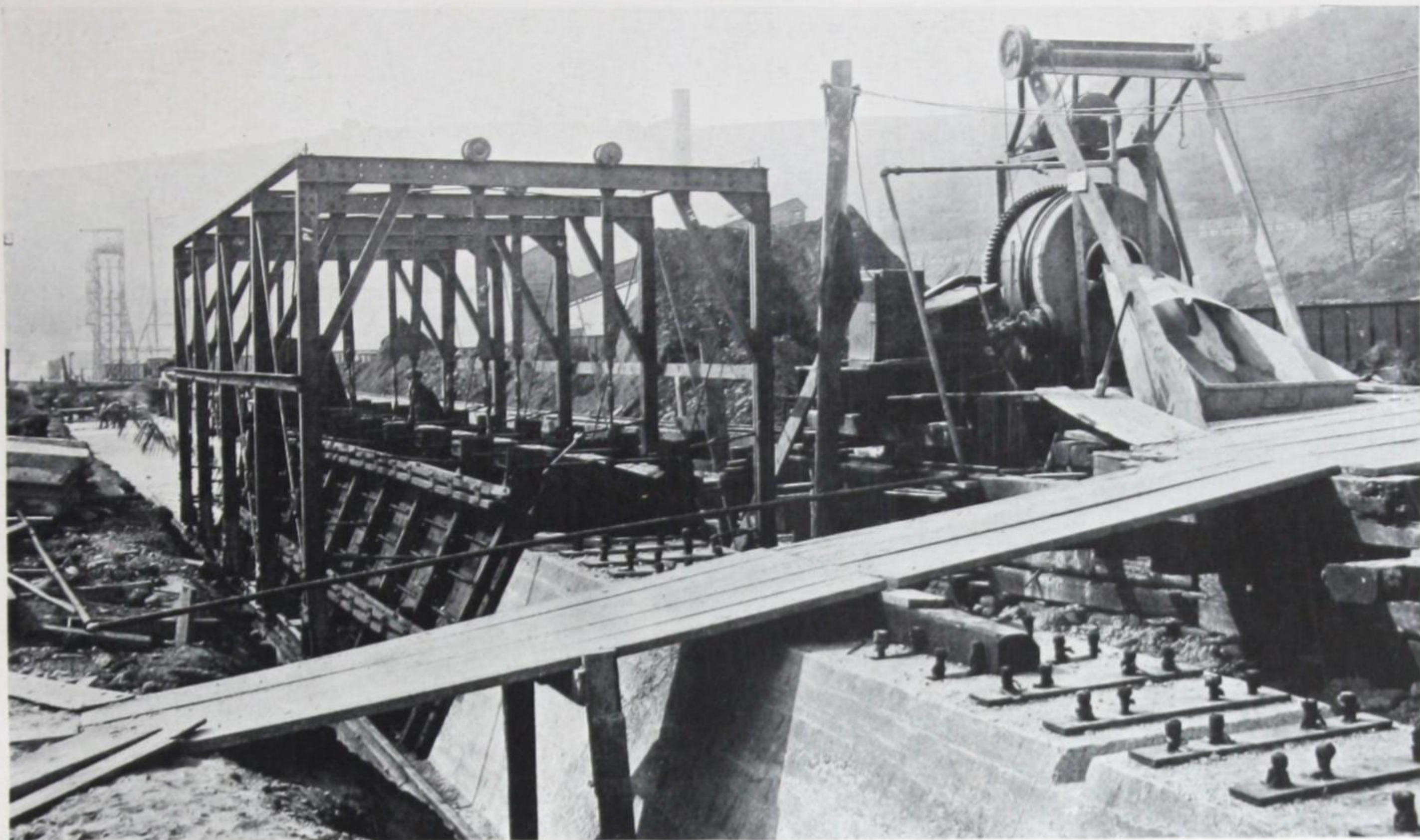
Left: Illinois Waterways Lock, Starved Rock, Ill. Woods Bros. Construction Co. Ltd., contractor. Another view of forms described on page 40. The photograph shows bulkhead swung open.



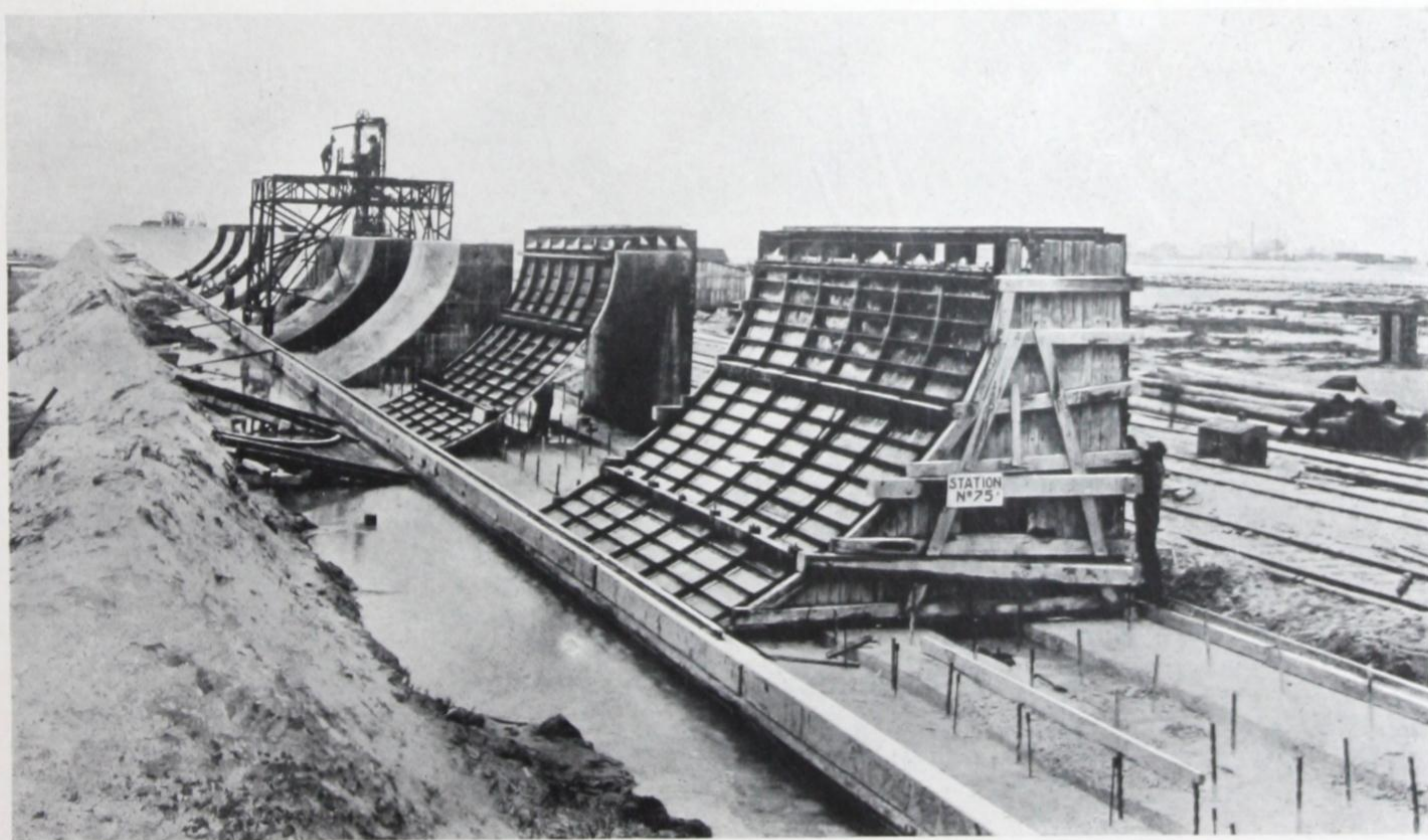


Blaw-Knox traveling steel wall forms adjustable for varying heights of wall, maximum 20'. Traveler is of cantilever type. Note hoist arrangement for placing concrete. Calumet-Sag Channel, Sanitary District of Chicago.  
A. Guthrie & Co., Inc., contractor.





Blaw-Knox 10' 6" traveling wall forms used on footing walls for Ore Dock, Cambria Steel Company, Johnstown, Pa.



Blaw-Knox self-supporting traveling wall forms. Forms furnished in 30' units 13' high. Note: One traveler was supplied for two sets of forms. Galveston Sea Wall, Galveston, Texas, U. S. Engineering Corps.



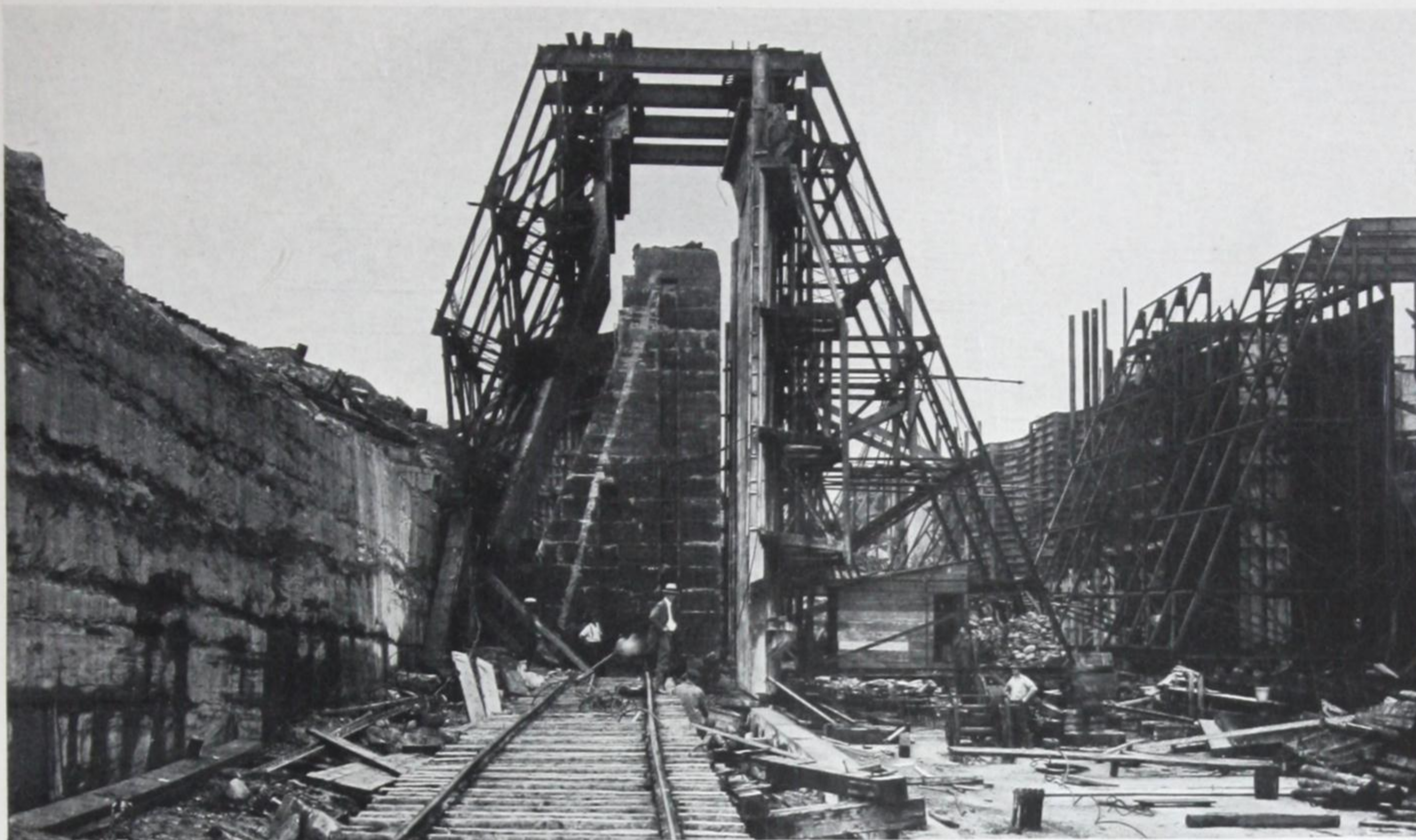


Traveling steel forms used by the Blaw-Knox Company in building retaining wall at the works in Blawnox, Pa.  
Note the use of skip hoist for placing concrete.

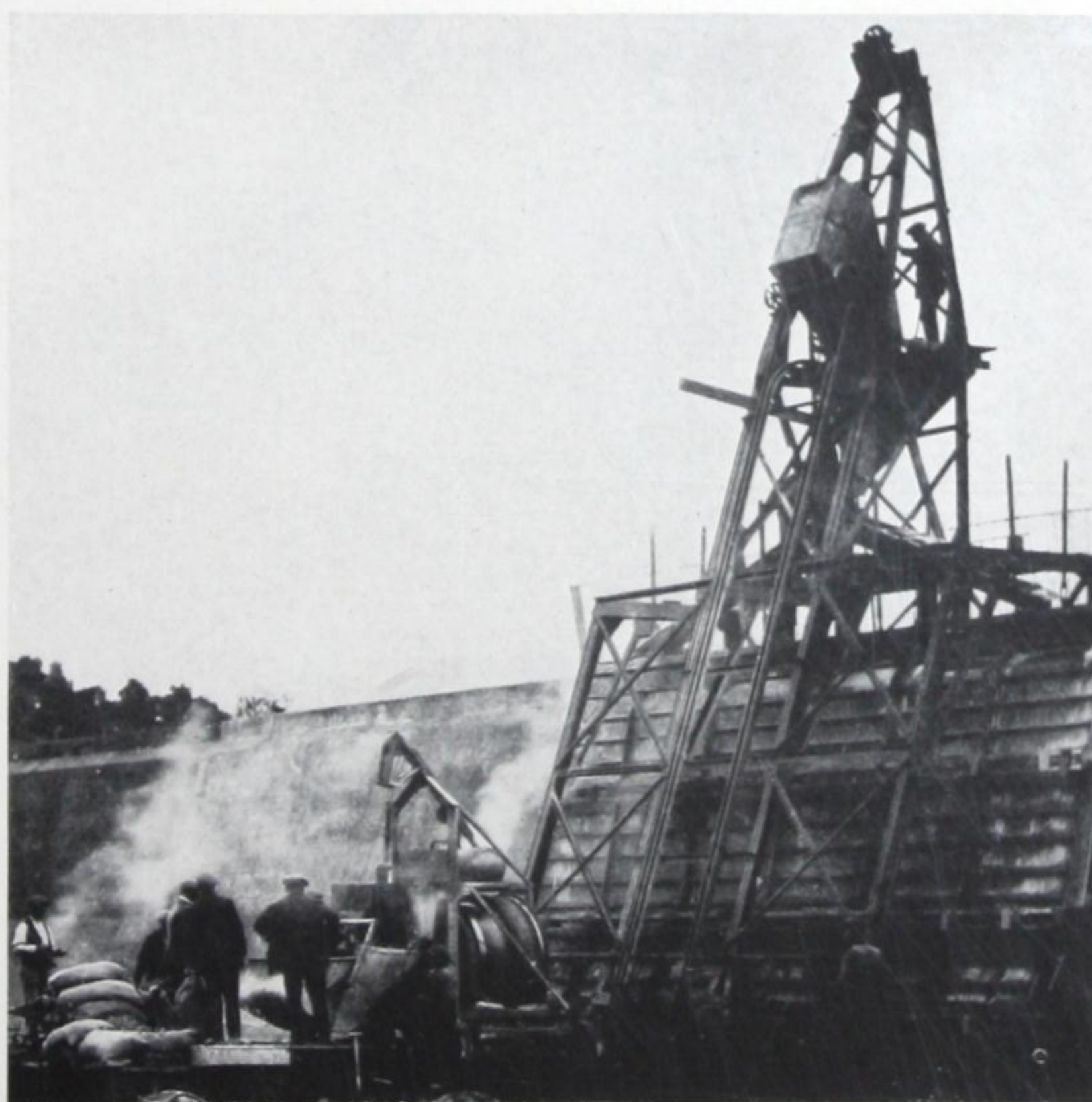


Tampa Sea Wall, Tampa, Fla. McGucken, McGucken & Edwards, contractors. Blaw-Knox traveling telescopic wall forms used in 25' units. Height of wall 10' 6".



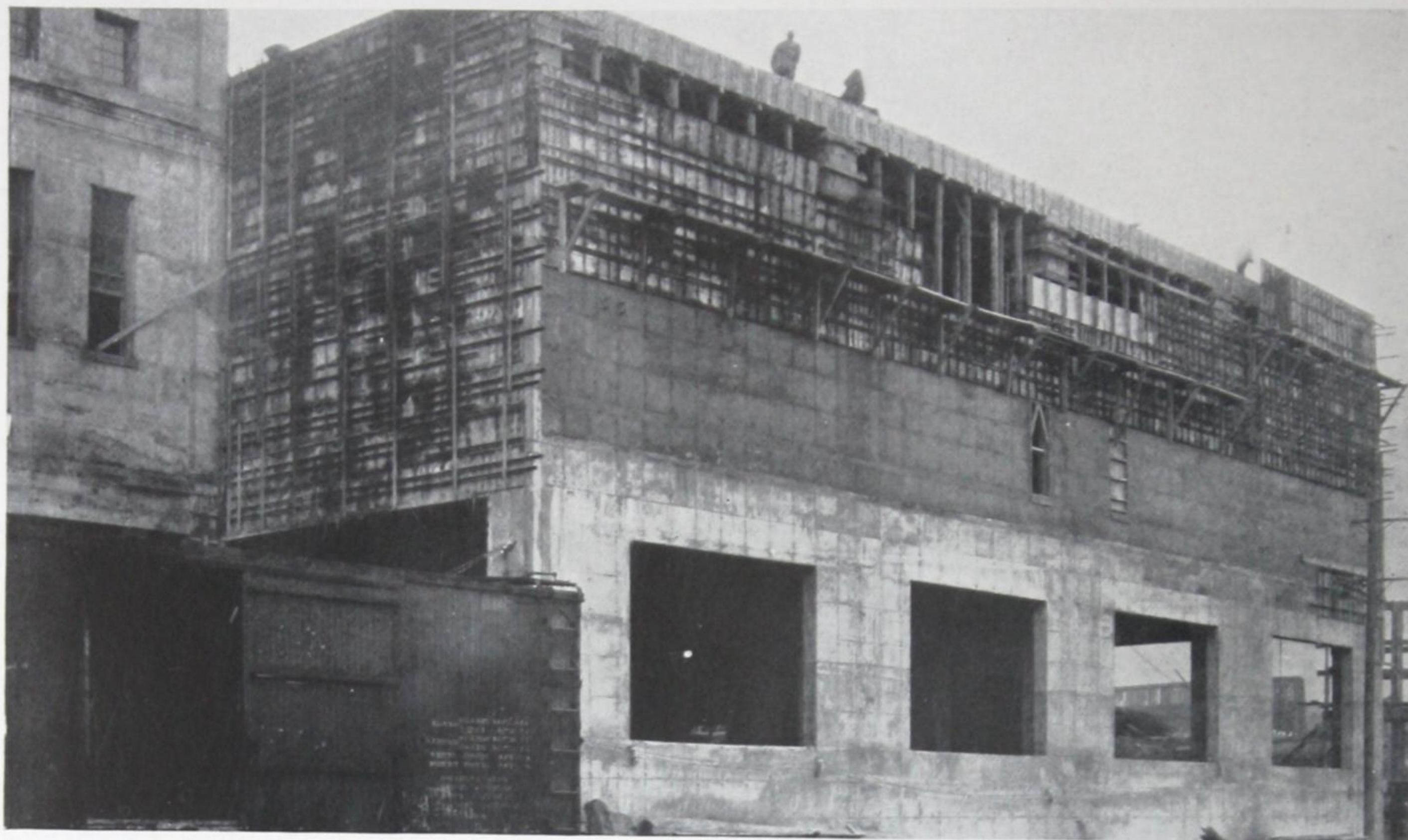


Soo Canal, St. Marys River, Sault Ste. Marie, Mich. Oscar Daniels Company, contractor. Blaw-Knox traveling wall forms, maximum height approximately 50'.

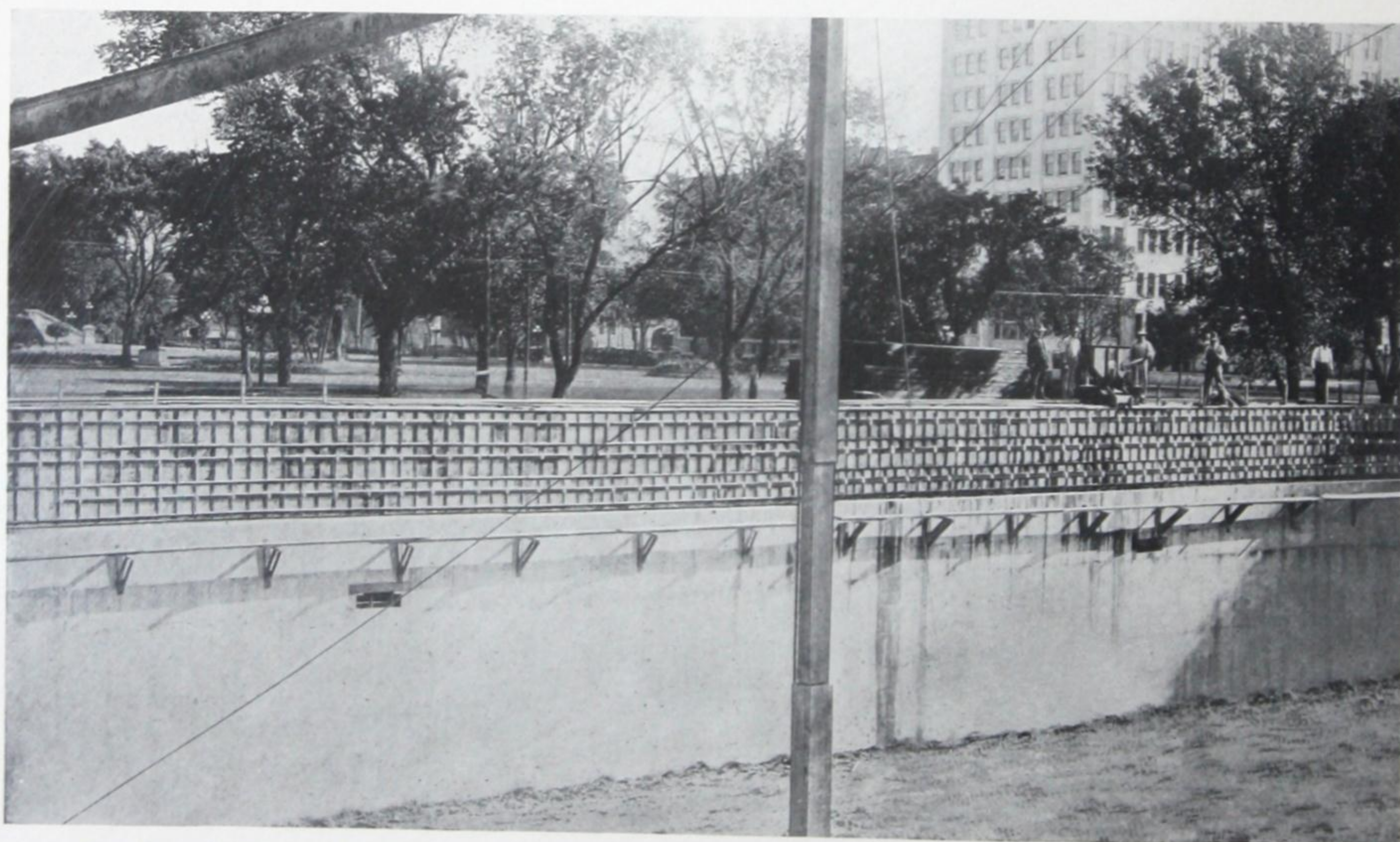


Aberdeen Reservoir, City of Aberdeen, Scotland. Blaw-Knox traveling steel wall forms 17' high with skip hoist arrangement for placing concrete.



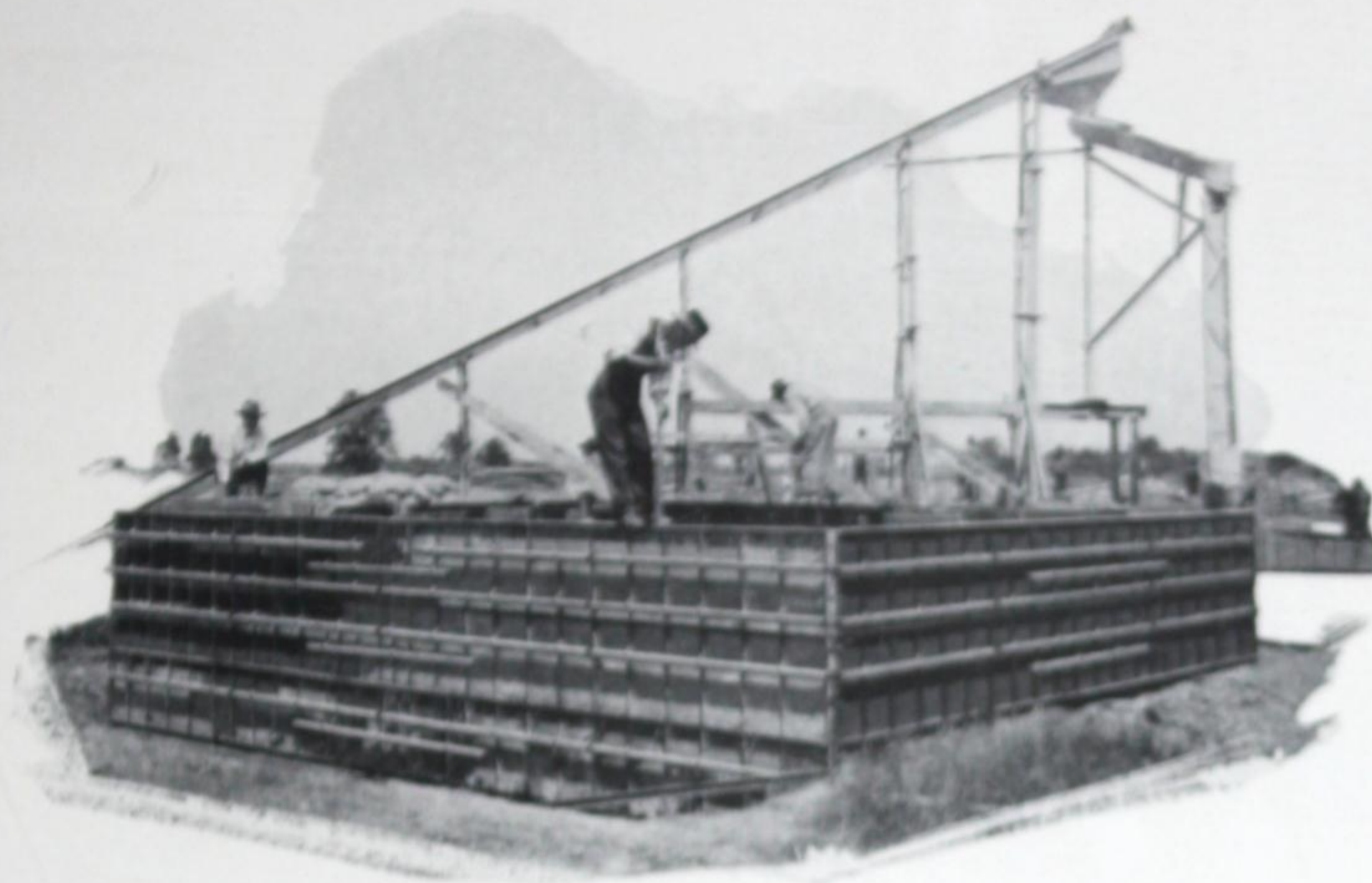


Blaw-Knox Standardized Wall Forms used in construction of North Pole Ice Company's building, Pittsburgh, Pa.  
Joseph F. Love, contractor. Four course method in use.



Blaw-Knox Standardized Wall Forms used on foundation walls, Masonic Temple, Topeka, Kansas. F. M. Spencer & Sons,  
contractor.





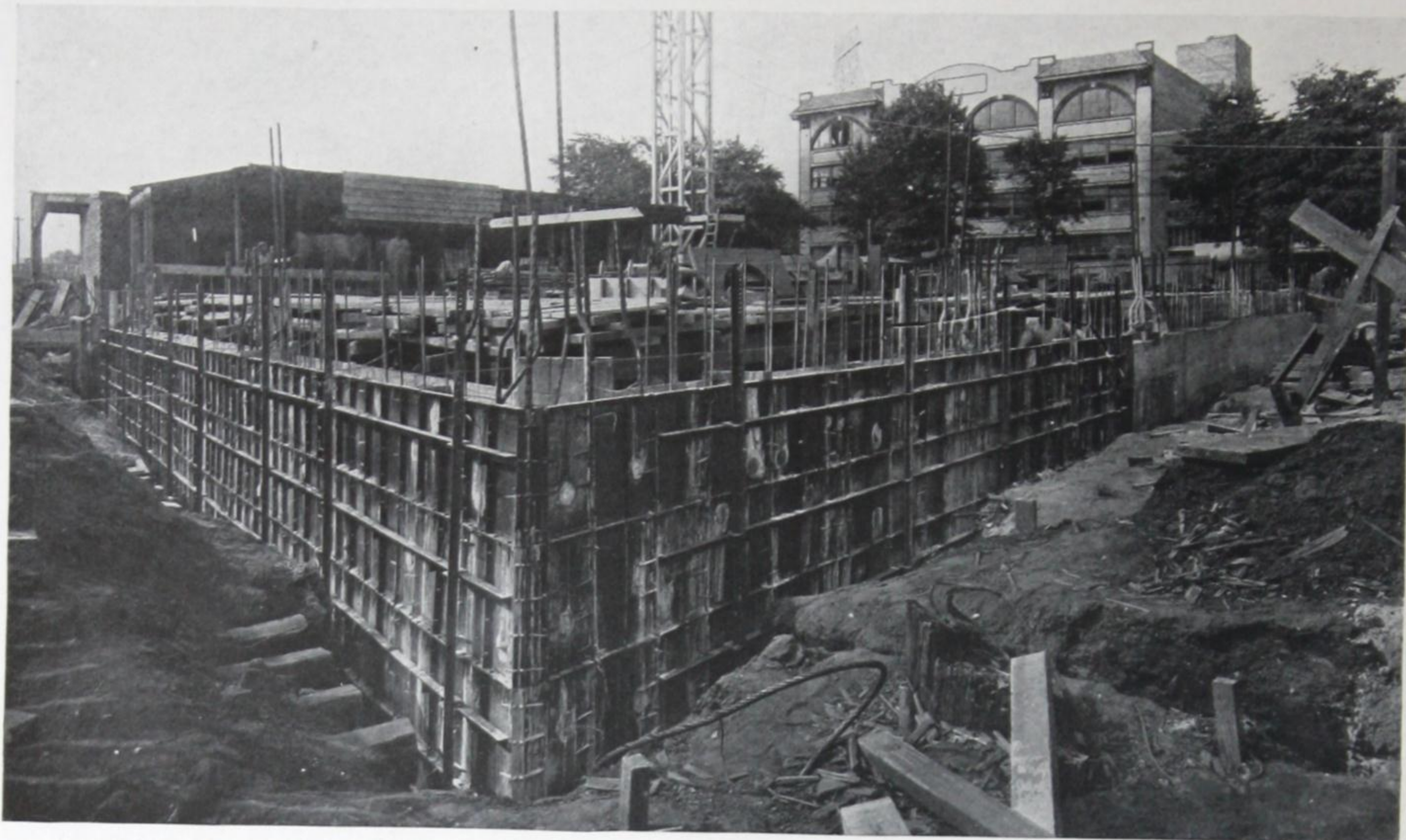
## Standardized Wall Forms

**B**LAW-KNOX Steel Forms for light walls and foundations are adaptable to a very wide range of work. They are peculiarly suited to the construction of light retaining walls, foundations and super-structures, but have found wide application on many other varieties of construction such as grain elevators, coaling stations, sewage purification plants, baffle walls in reservoirs, side walls of tunnels and sewers, silos and the walls of circular tanks.

These forms consist of interchangeable standard steel panels in units two feet square, fractional panels, lap panels and corner panels with suitable means for alignment and adjustment.

Blaw-Knox Standardized Wall Forms are equally well adapted for large or small jobs. They are assembled and handled rapidly and easily: They allow the contractor to start pouring operations sooner: Every part is simple, self-aligning and foolproof: They cannot warp, shrink, crack, leak or wear out: They absorb no oil and lose no grout. The finished work has a smooth finish with uniform thickness throughout. Blaw-Knox Light Wall Forms absolutely eliminate the use of lumber and furnish the contractor with a standard plant for concreting which is permanent.



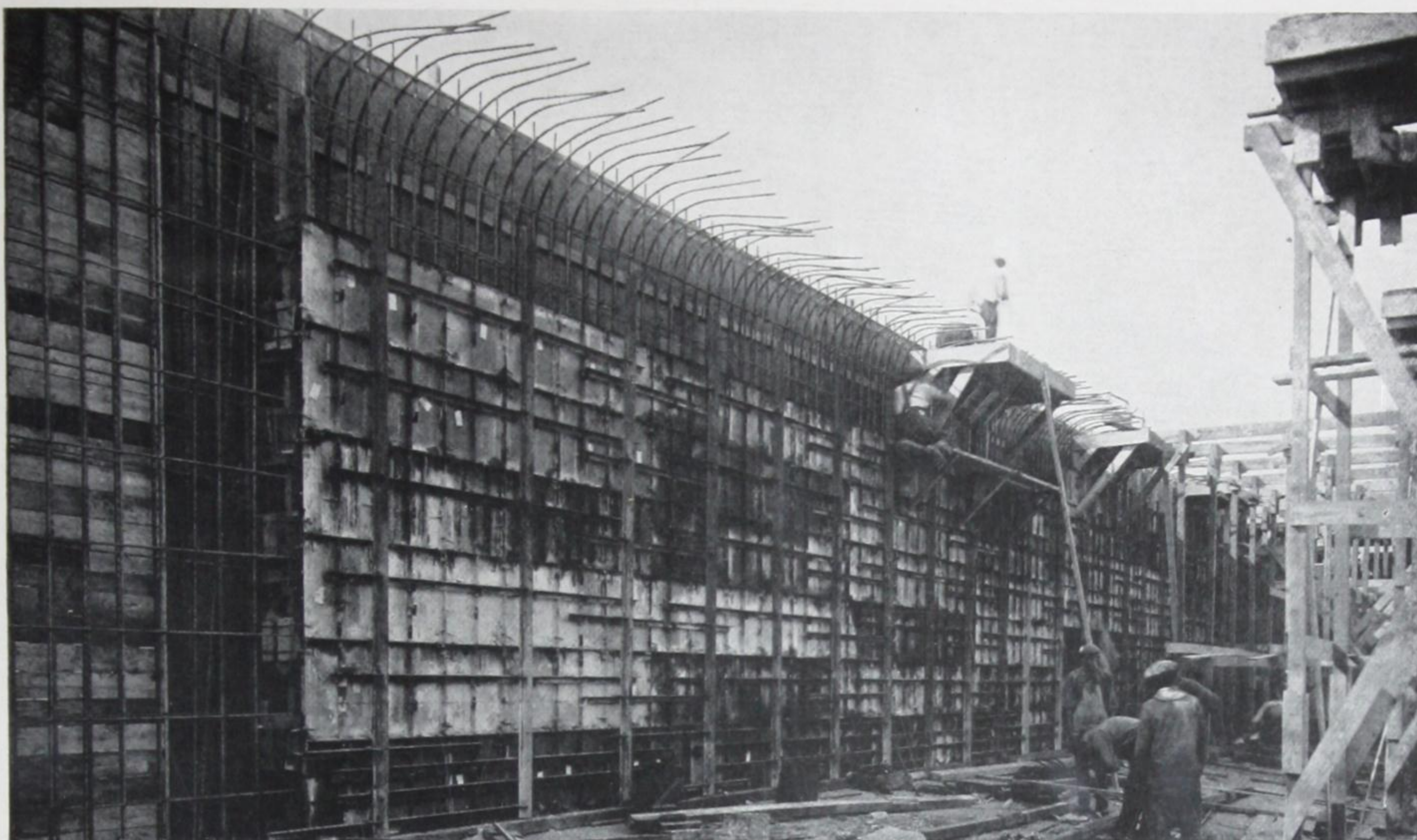


Blaw-Knox Standardized Wall Forms used in pouring foundation walls of industrial building.

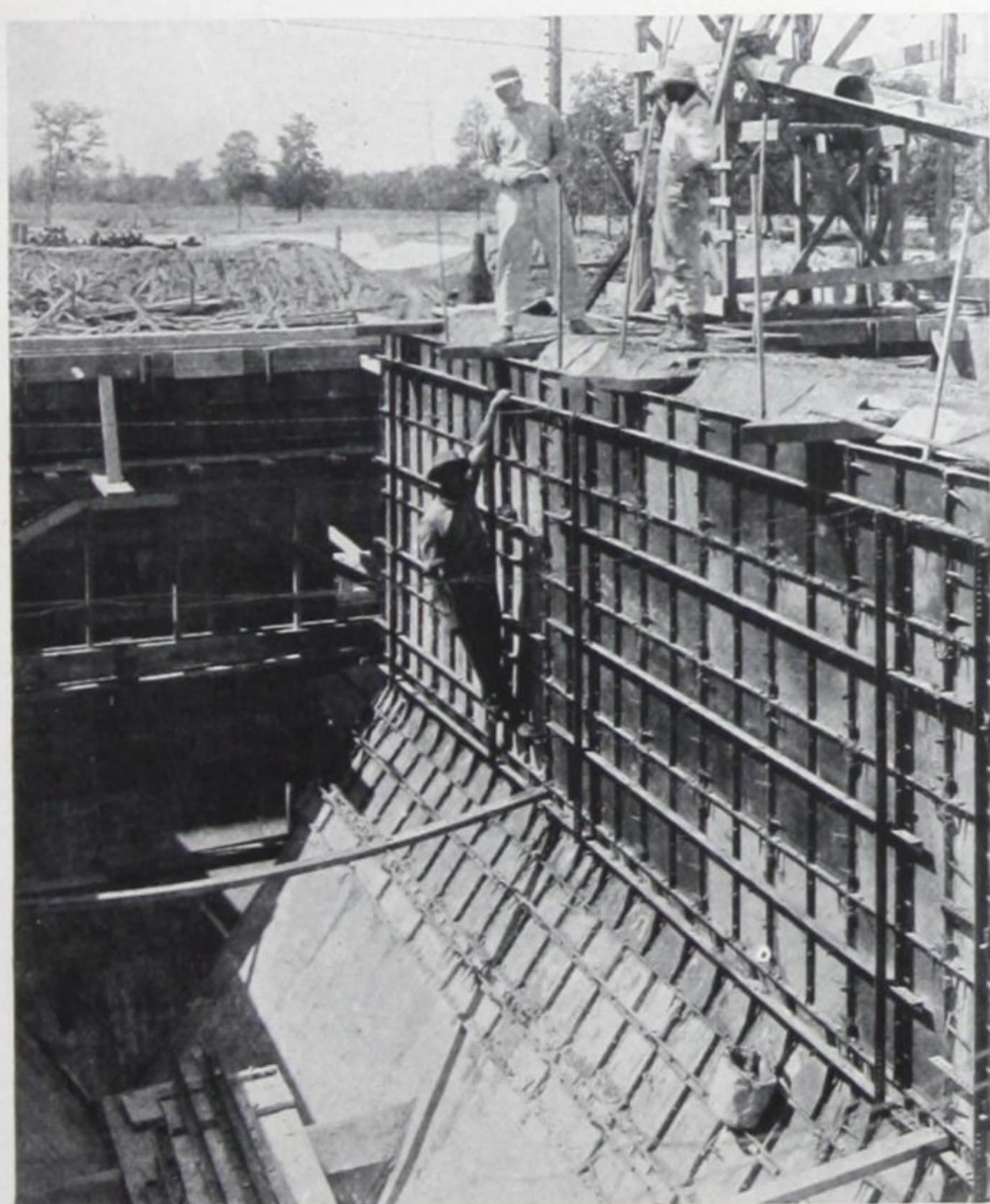


Blaw-Knox Standardized Wall Forms used in construction of cotton warehouse.

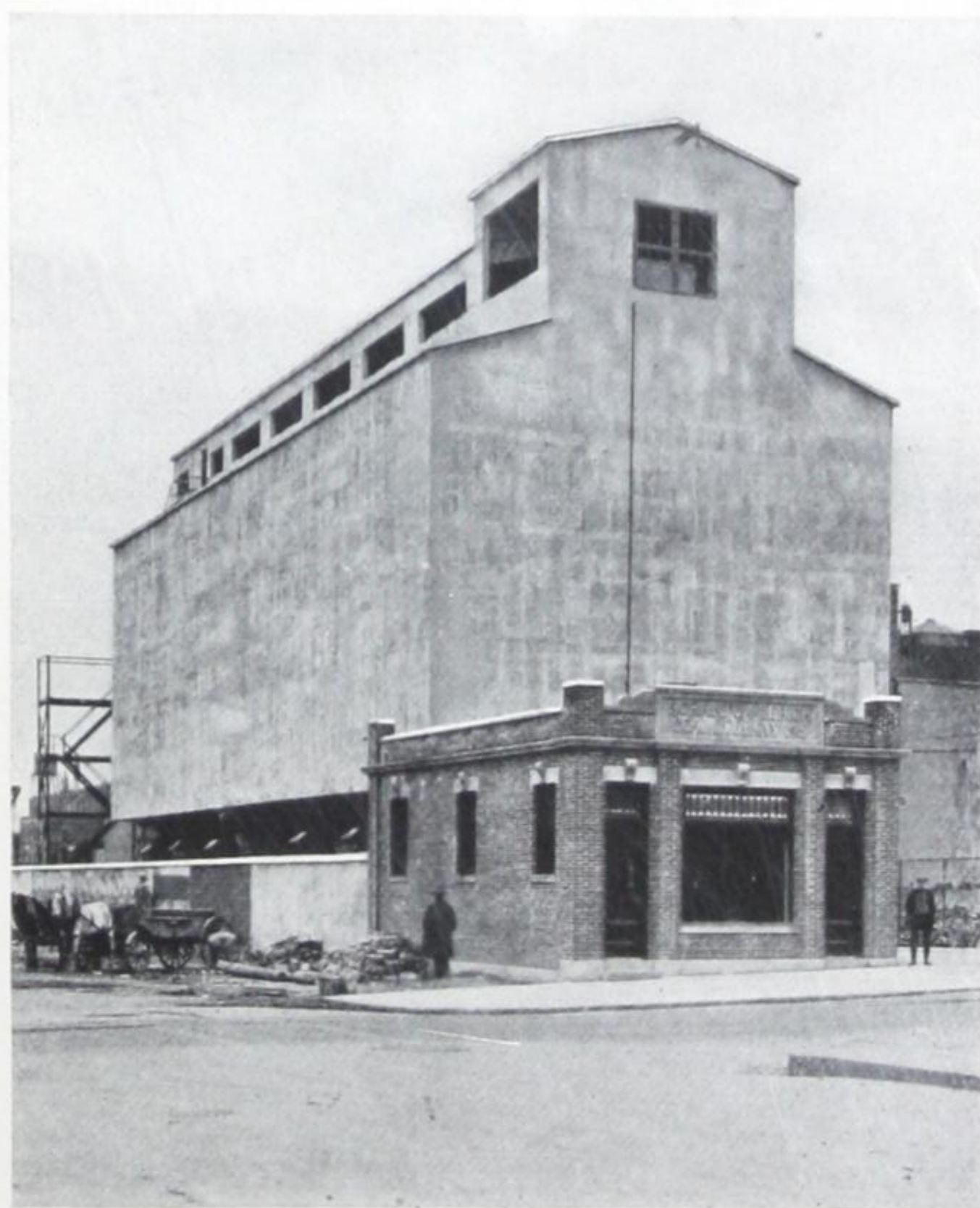




Blaw-Knox Standardized Wall Forms used in construction of filtration plant, Toledo, Ohio. H. J. Spieker & Co., contractor.



Blaw-Knox Standardized Wall Forms used in construction of Imhoff Tanks in sewage disposal plant.



Building for storing and handling coal, built entirely with Blaw-Knox Standardized Wall Forms.



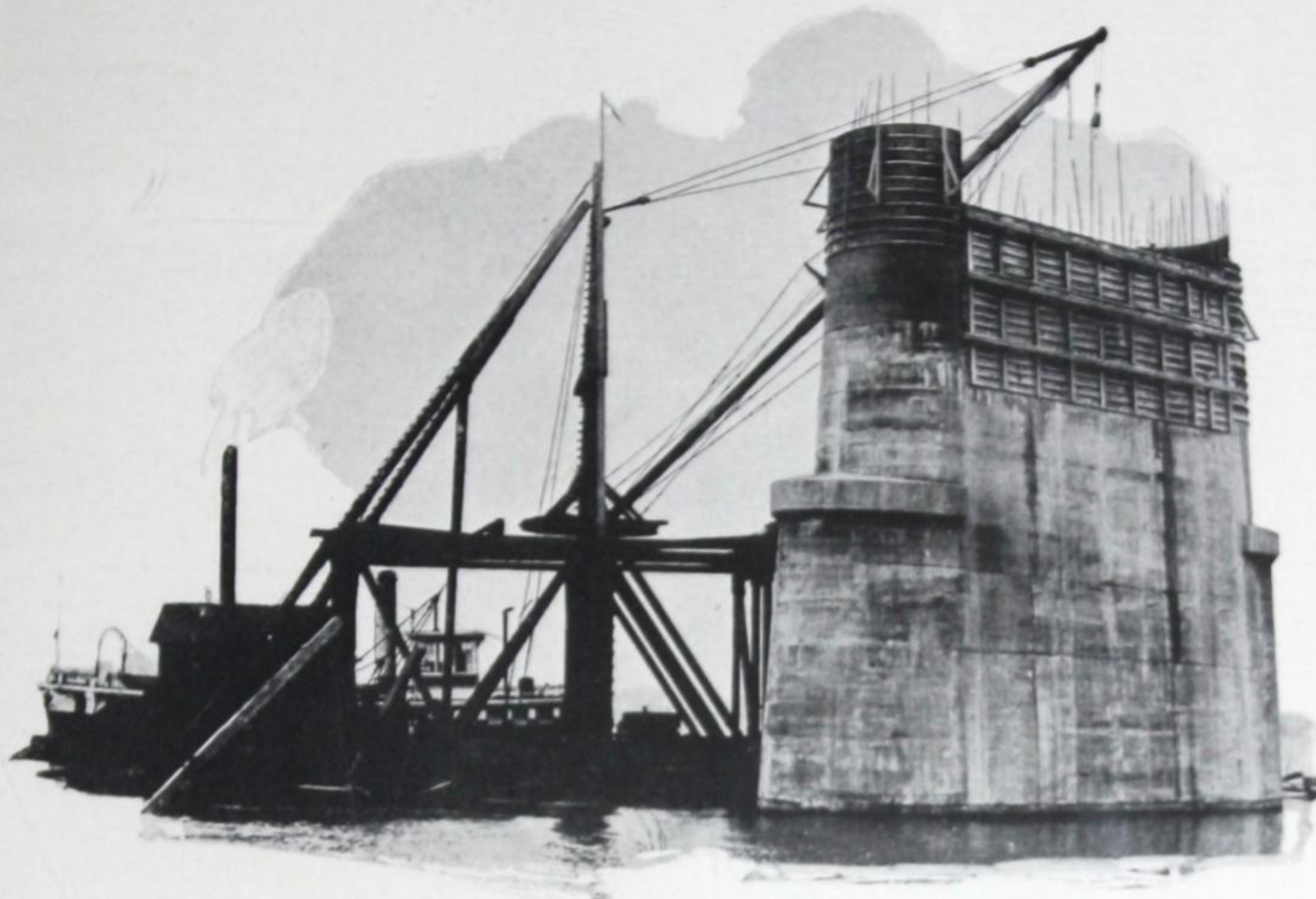


Ashley River Bridge, Charleston, S. C. Sanford & Brooks Co., contractor. Blaw-Knox special steel pier forms 45' high. Special arrangement was made to permit struts in cofferdam.



Southern Pacific Company's Bridge over Suisun Bay, near Benicia, Cal., Siems, Helmers and Schaffner, Inc., contractor. Blaw-Knox Caisson Forms 60' x 40' x 10' and Blaw-Knox inside well forms 11' 8" x 10' 6". The 60' x 40' x 10' caissons forms were remodeled after use for building caissons, to form plane sides of 90' pier shafts.

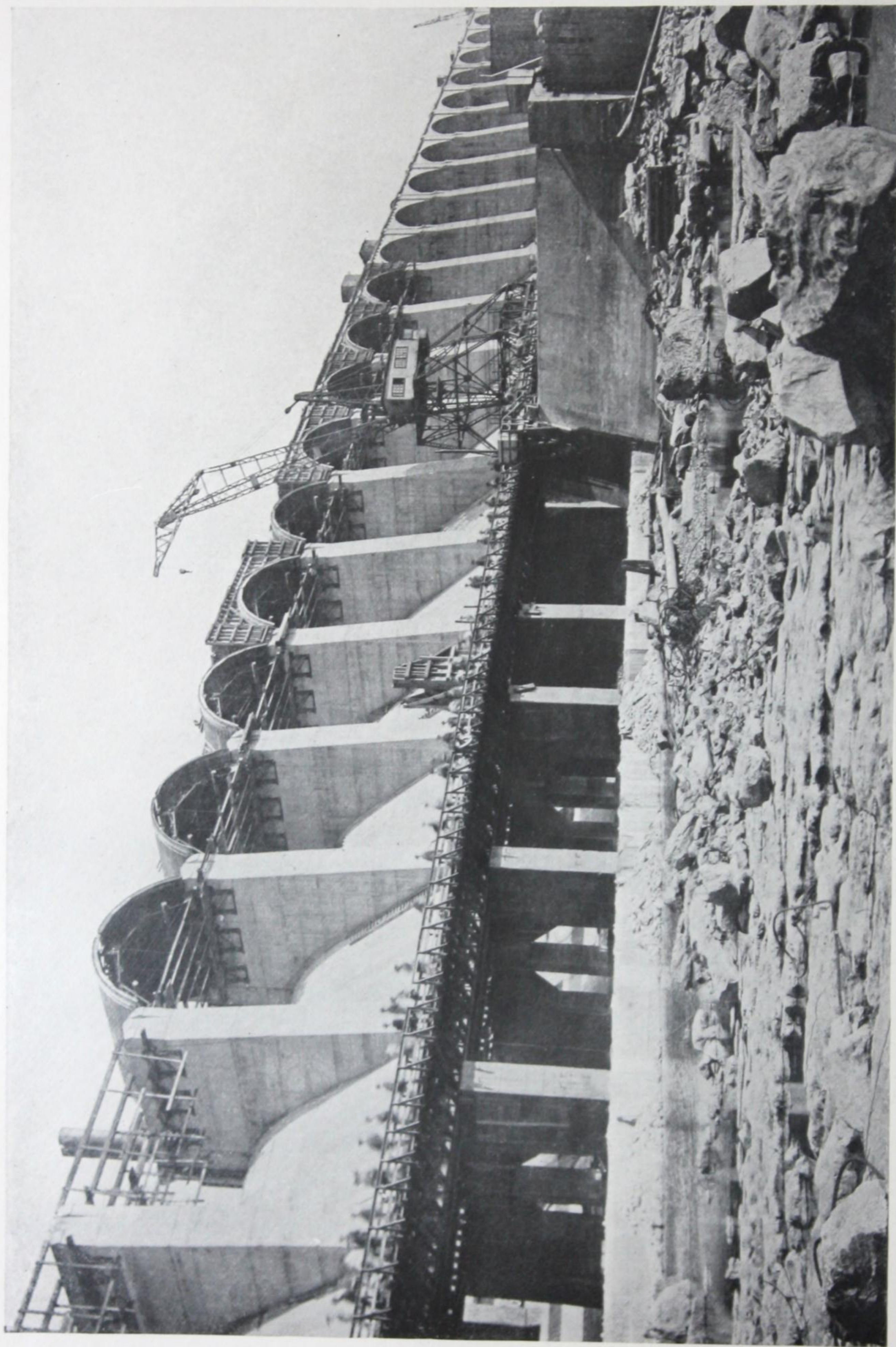




## Concrete Piers

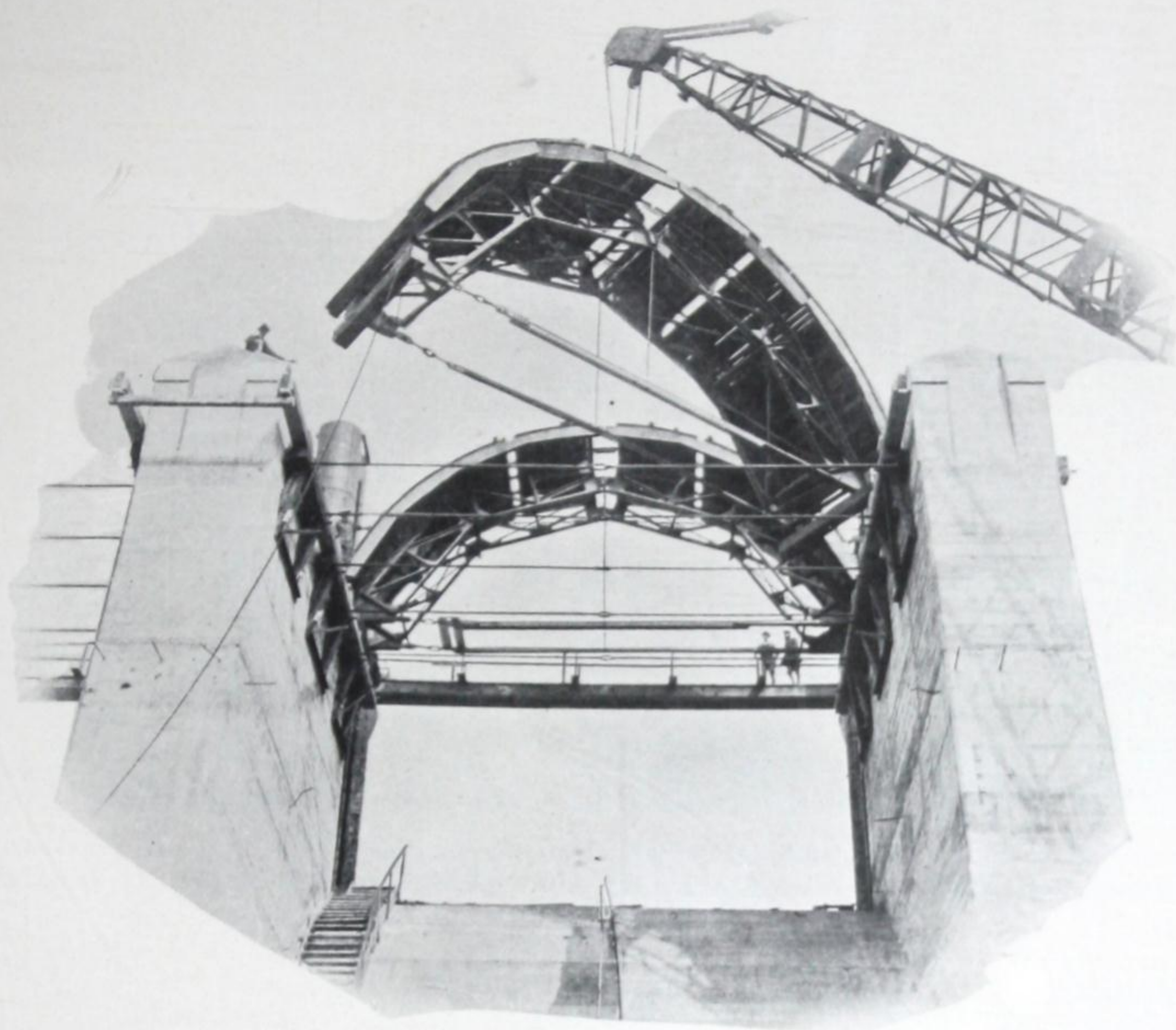
**T**HE construction of concrete piers is peculiarly specialized and capable of successful accomplishment only when specially designed forms are used. The Blaw-Knox Company has designed and manufactured hundreds of different forms for pier work and has wide experience with and definite knowledge of the many peculiar conditions surrounding this class of work. Blaw-Knox steel forms can be furnished for round-nosed piers, flat-sided piers, circular piers, sloping piers, hollow piers and practically every other type known to construction.





Blaw-Knox steel centering being used for 38 spans 37' 6" clear with 13' 9" rise. Barrel type arch 26' 0" wide. This centering was supported on brackets anchored to piers. Wilson Dam Highway, Florence, Ala. U. S. Government Engineering Corps.

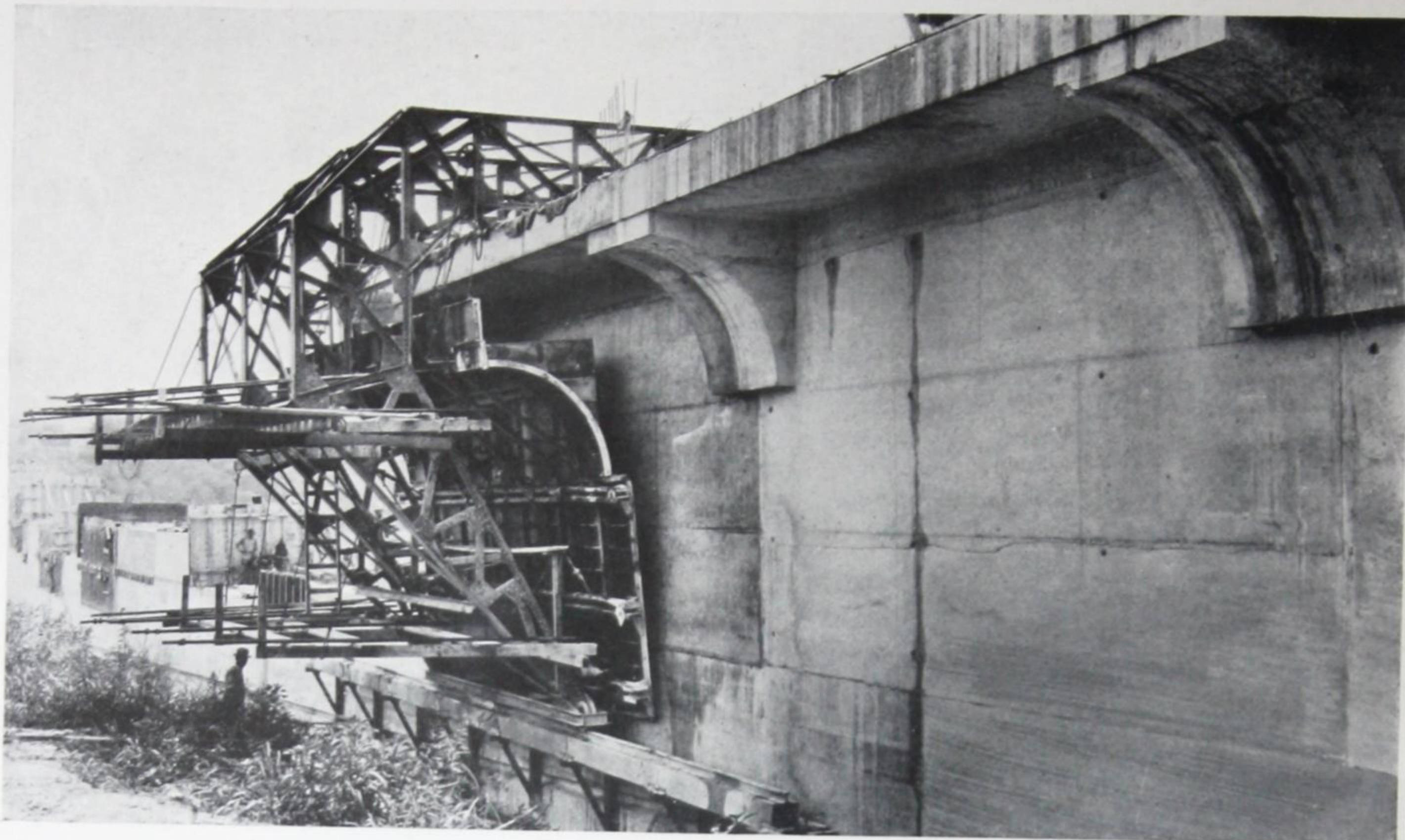




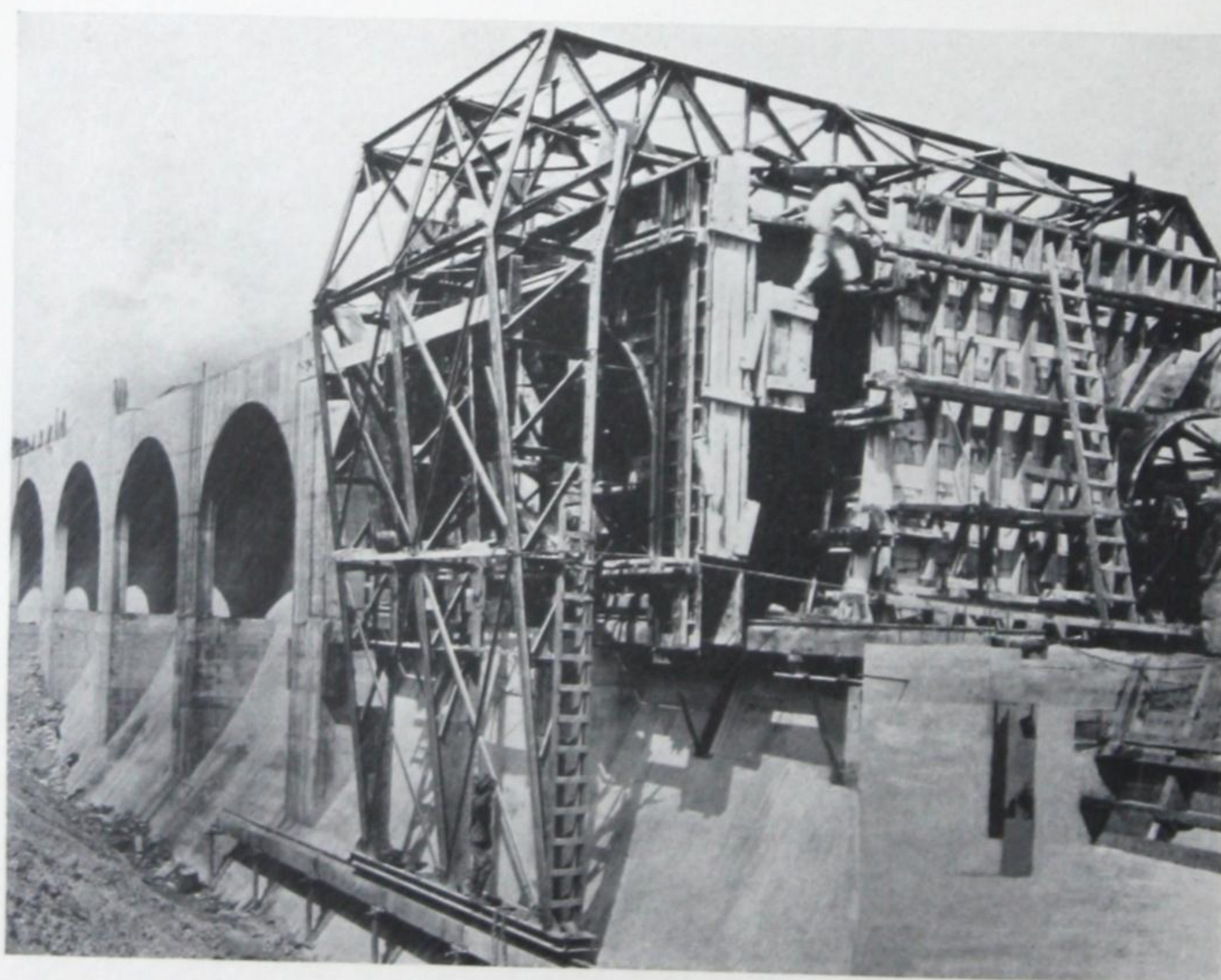
## Concrete Dams

**M**ANY concrete dams permit the efficient use of steel forms. Blaw-Knox Engineers from their study of and contact with such structures are in a position to render valuable assistance to engineers and contractors in connection with construction of concrete dams and to recommend the proper type and amount of forms to be used. Such service has in many instances been of assistance in accelerating construction and reducing costs.



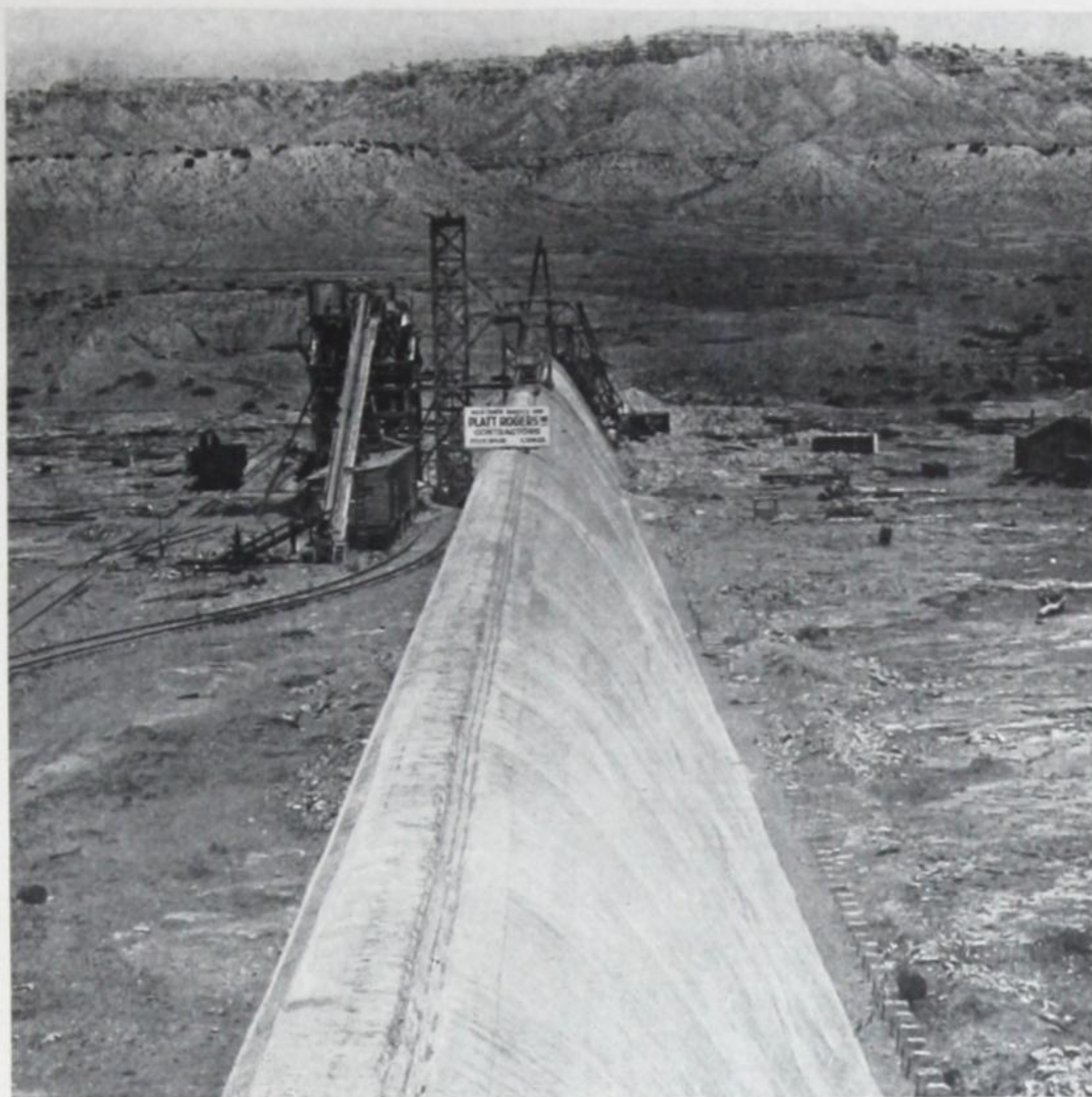


Olmos Dam Spur, San Antonio, Texas. McKenzie Construction Company, contractor. Blaw-Knox collapsible steel forms handled with traveler running on steel supporting brackets anchored to lower portion of the work.

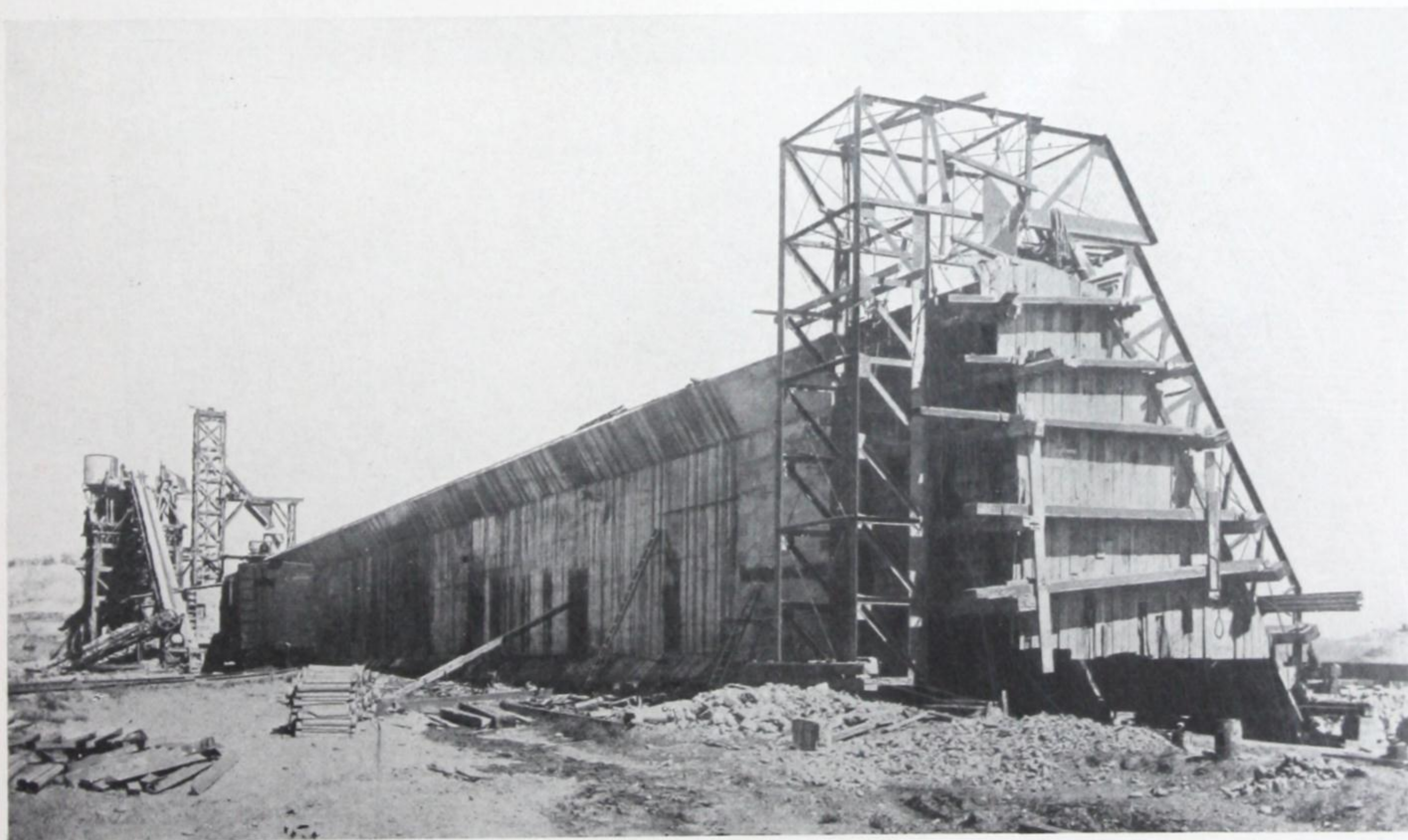


Another view of above forms.



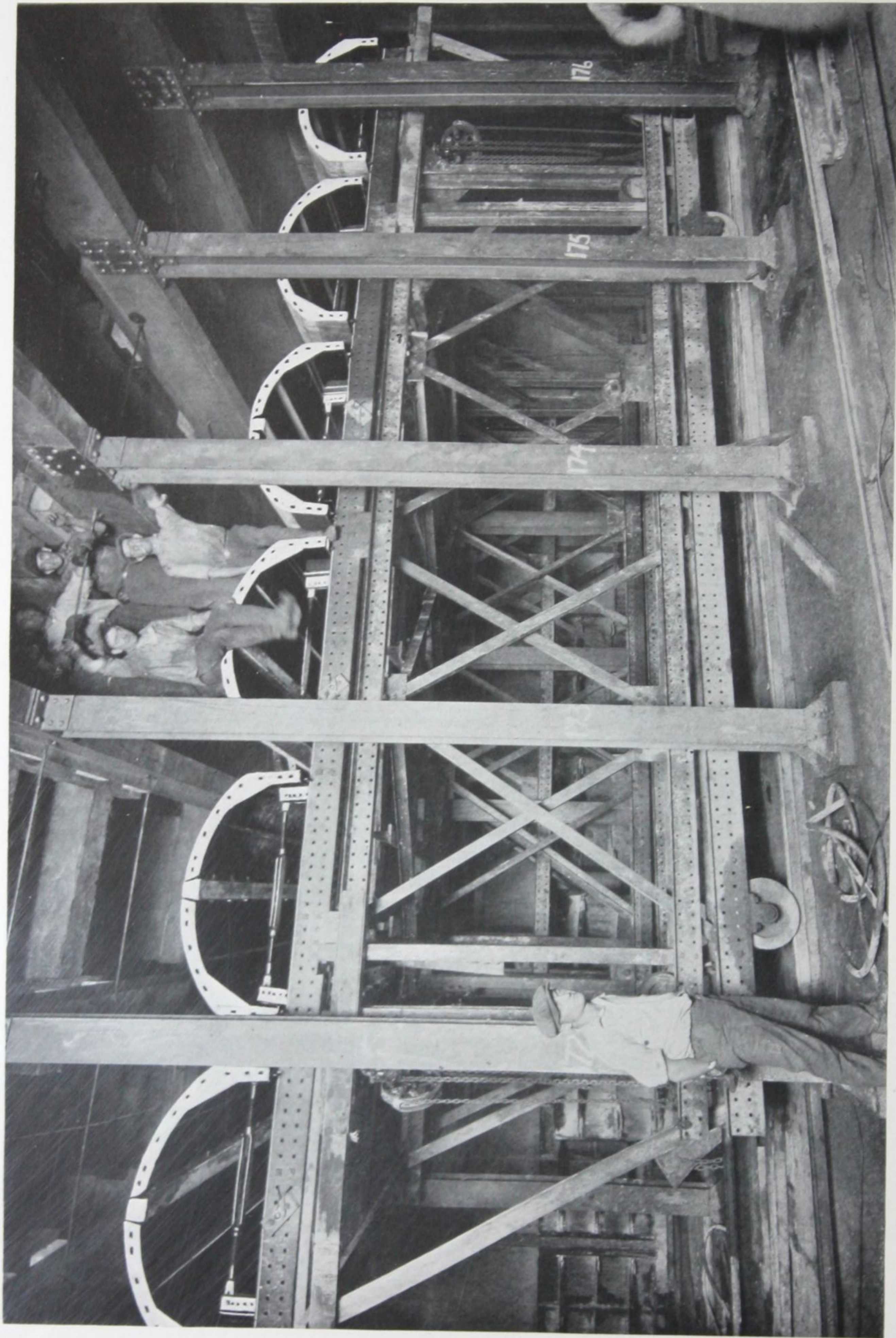


Colorado Dam, Pueblo, Colo. Platt Rogers, Inc., contractor.  
Blaw-Knox traveling form with special arrangement for plac-  
ing concrete.



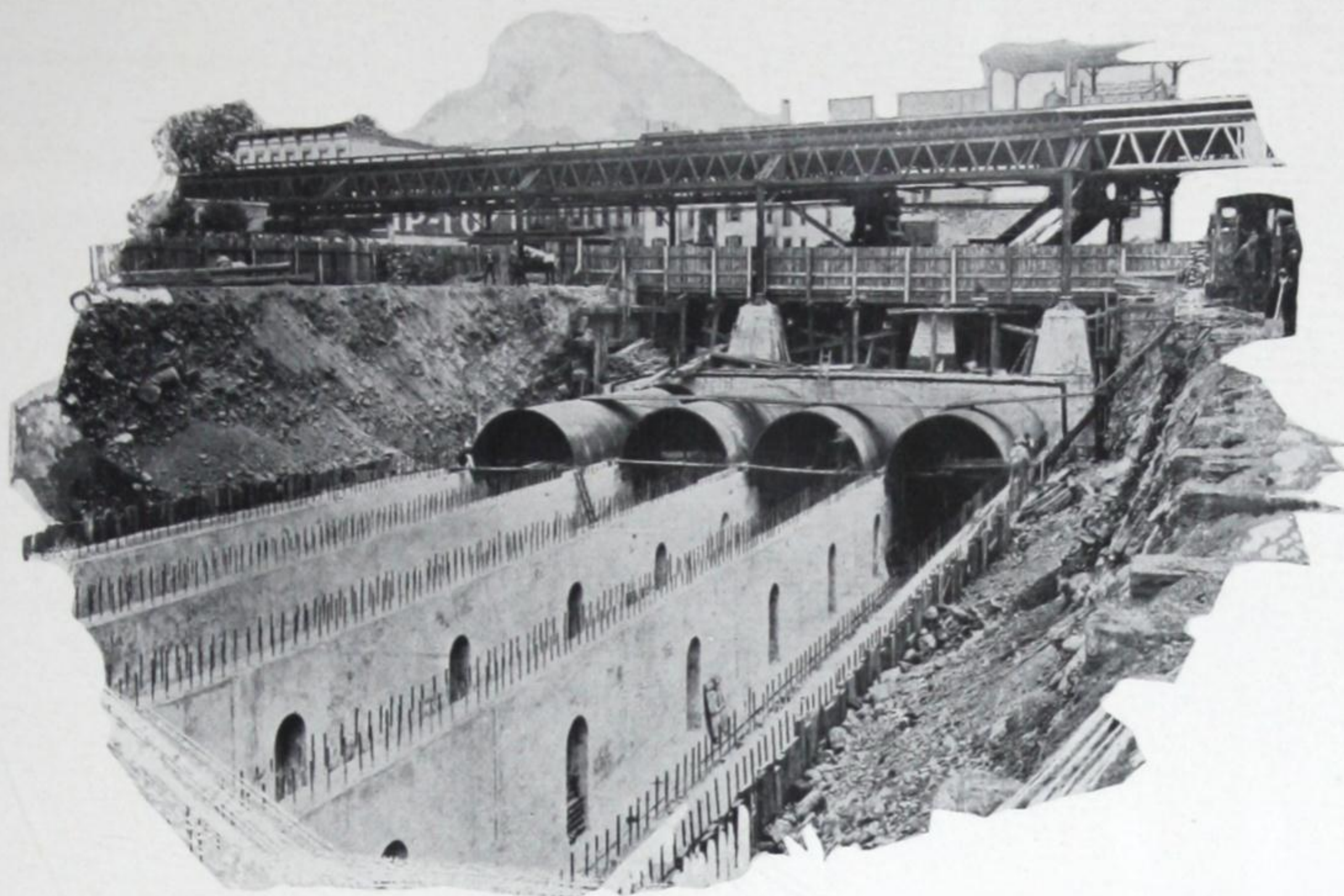
Another view of above construction.





New York Subways. A typical side view showing 6 bays of Blaw-Knox jack arch roof forms on traveler ready to be raised into position.

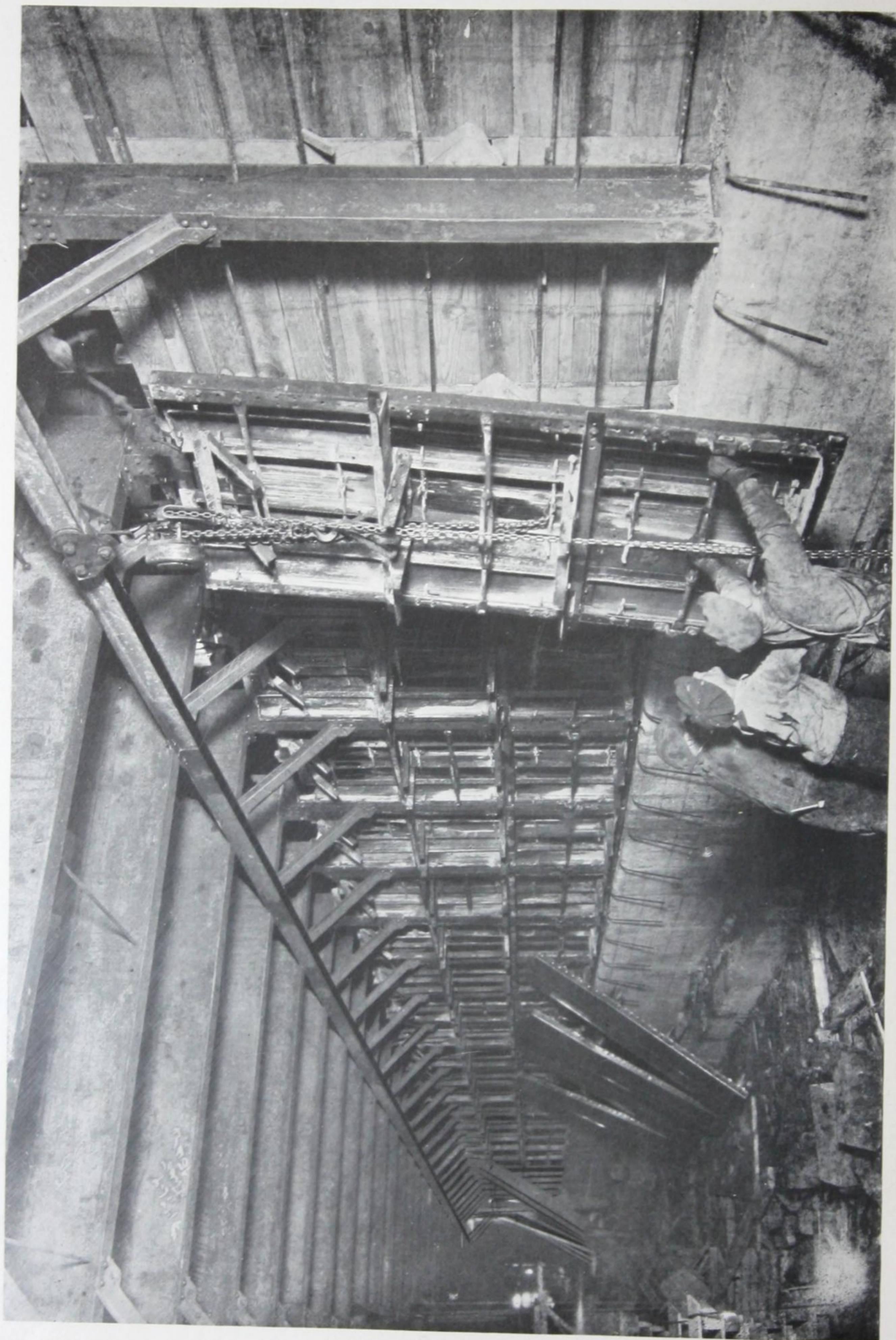




## Subways

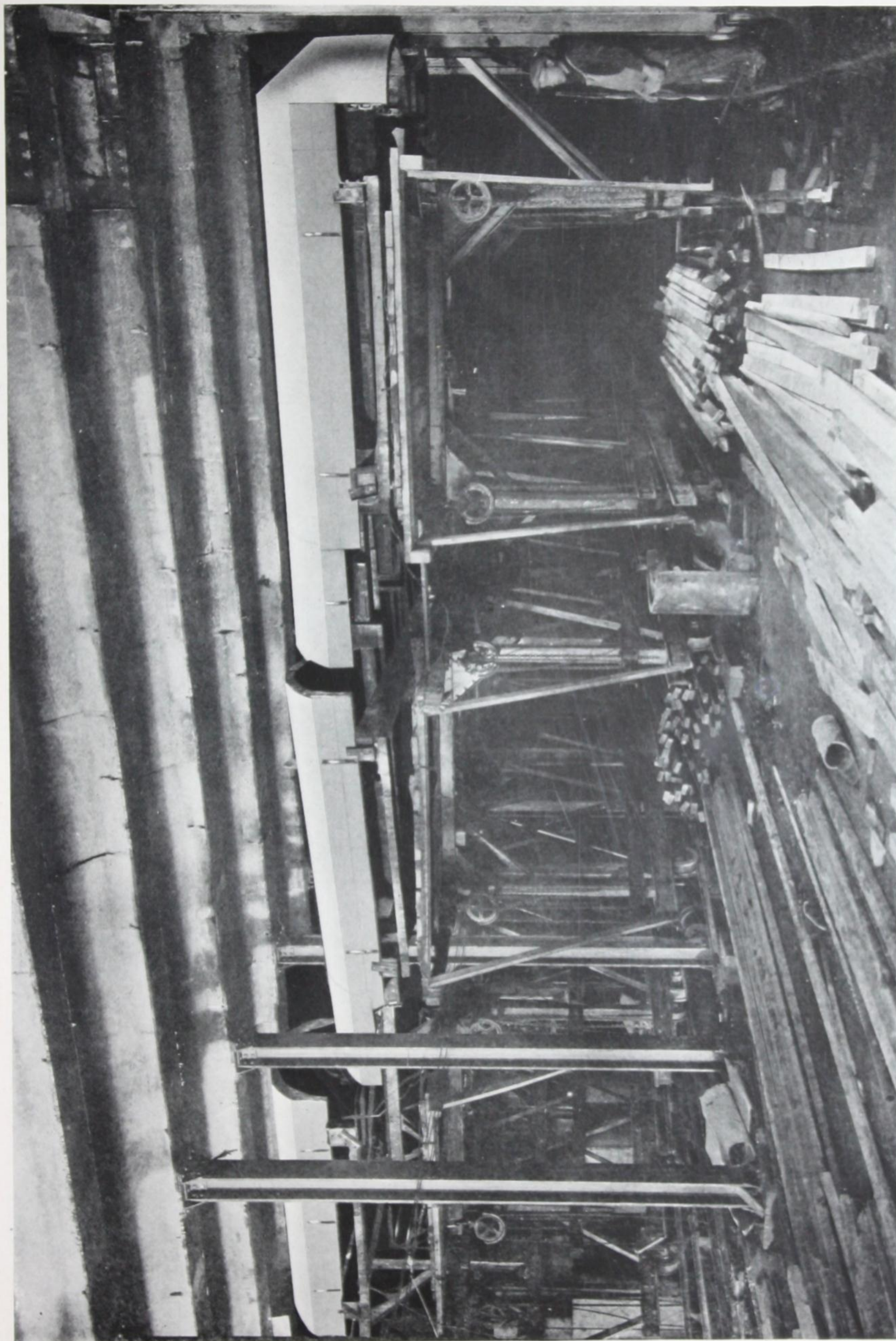
**C**ONCRETE form work in the construction of subways has been materially simplified and costs reduced through the use of Blaw-Knox Steel Forms on a great number of important jobs, a few of which are illustrated in this section.





New York Subways. Illustrating the use of trolley for handling Blaw-Knox side wall arch forms. Various methods are used in the handling of side wall forms, all of which give a surprisingly low form handling cost.



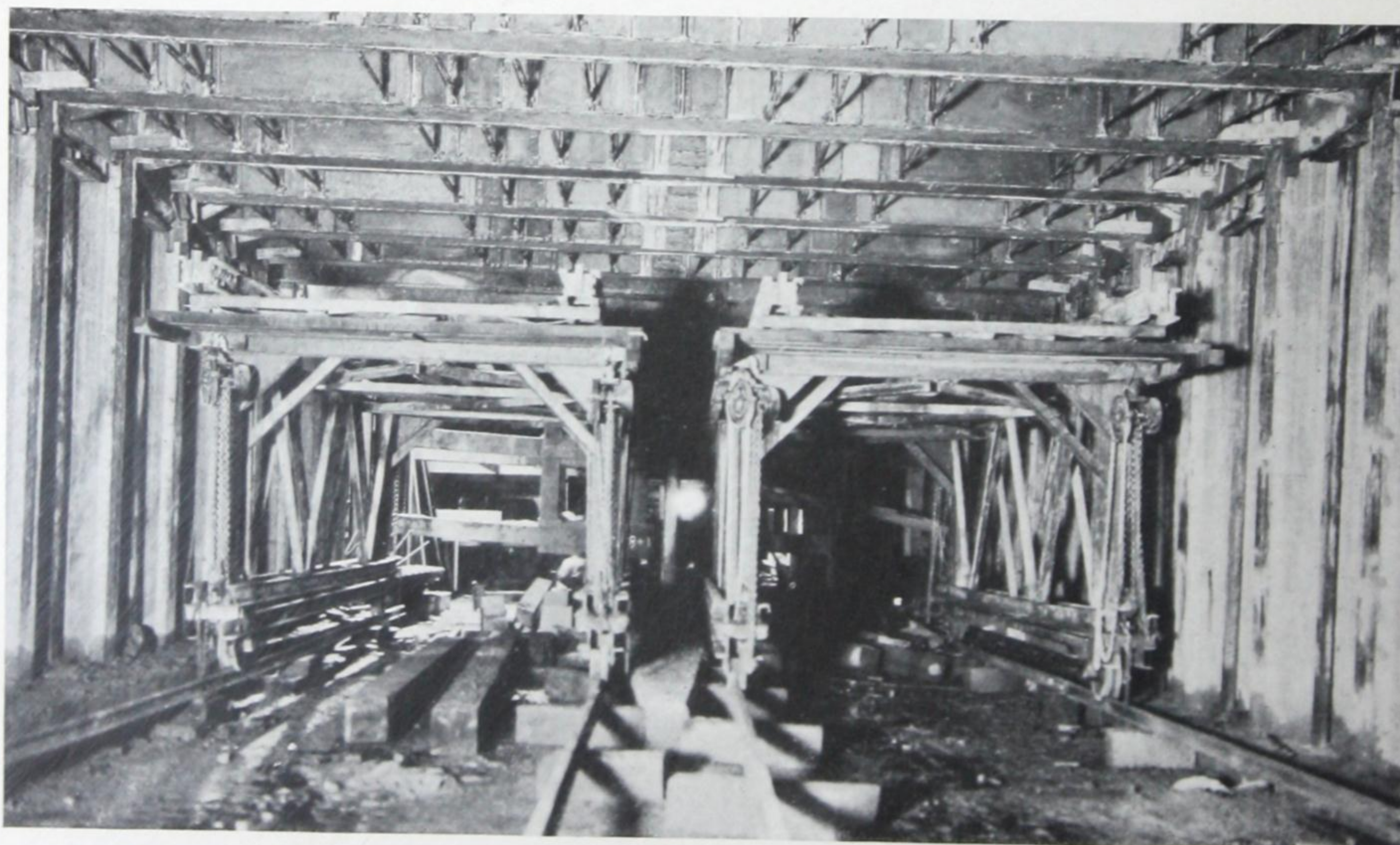


Philadelphia Subways. View showing jack arch forms lowered on travelers ready for moving ahead. Travelers handle from four to six bays of forms.  
The ease with which these forms are moved and set gives a very low handling cost.





New York Subways. Blaw-Knox traveling steel forms on outside track of New York Subway. Inclines and gun  
carriages are used in connection with this type of form.



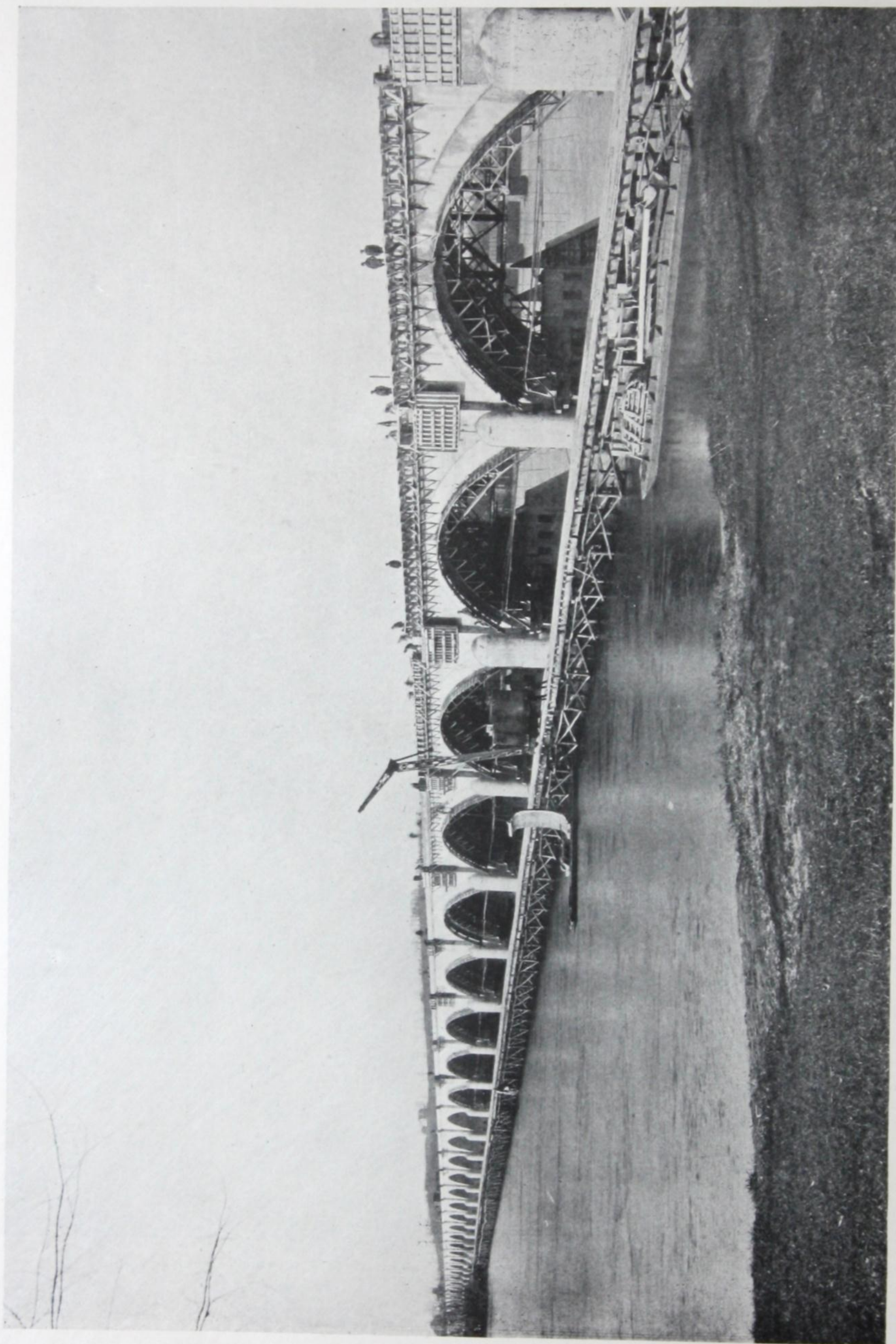
Another view of New York Subway forms showing roof jack arch forms in place and steel traveler for handling  
forms.





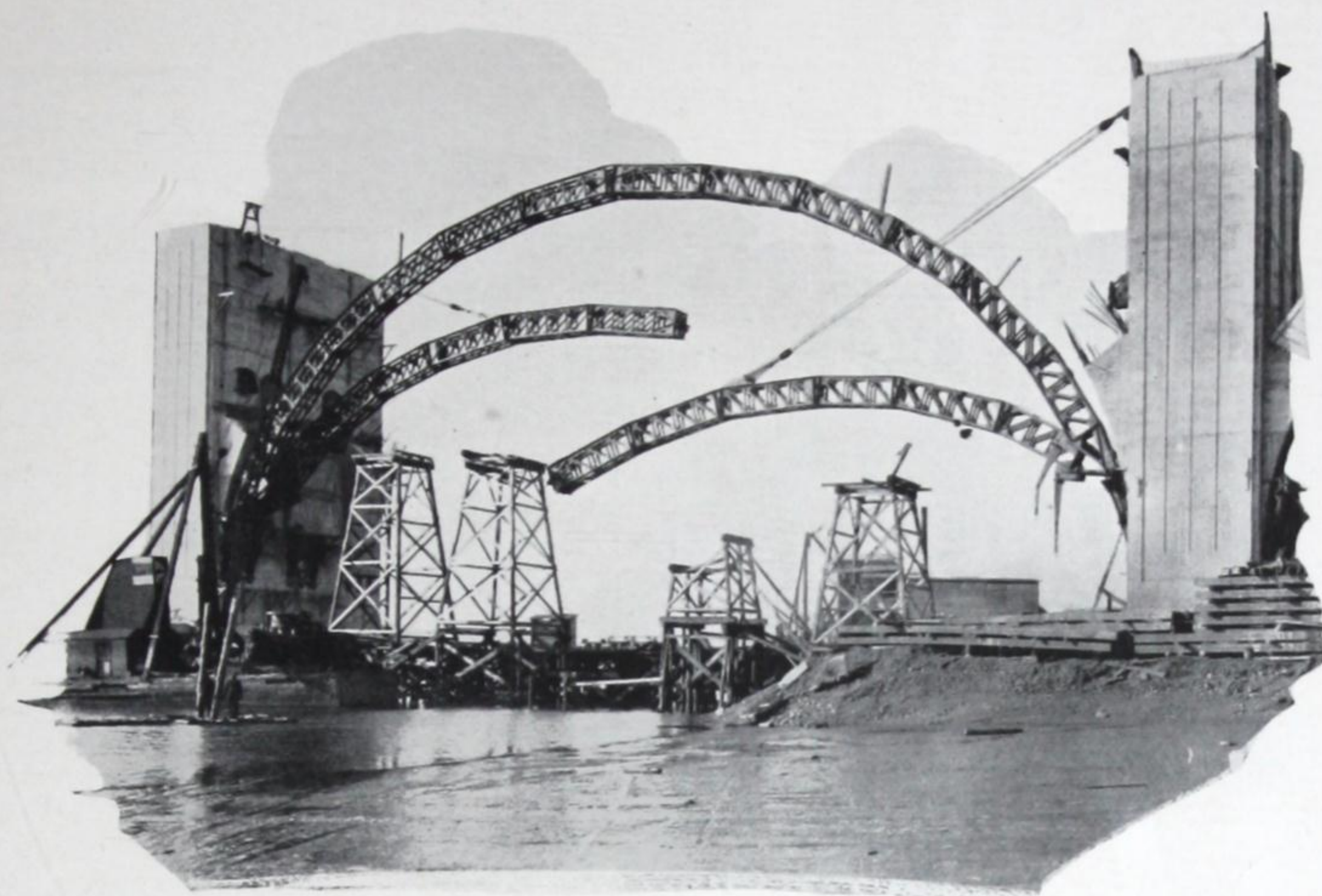
Cincinnati Subway. Blaw-Knox telescopic type rectangular forms 15' 6" wide and 15' 8" high.





Cumberland Valley Railroad Bridge, Harrisburg, Pa. Robert Grace Contracting Company, contractor. 44 spans—74' 6" and 77' between piers.  
Blaw-Knox steel centers were adjustable to both spans.



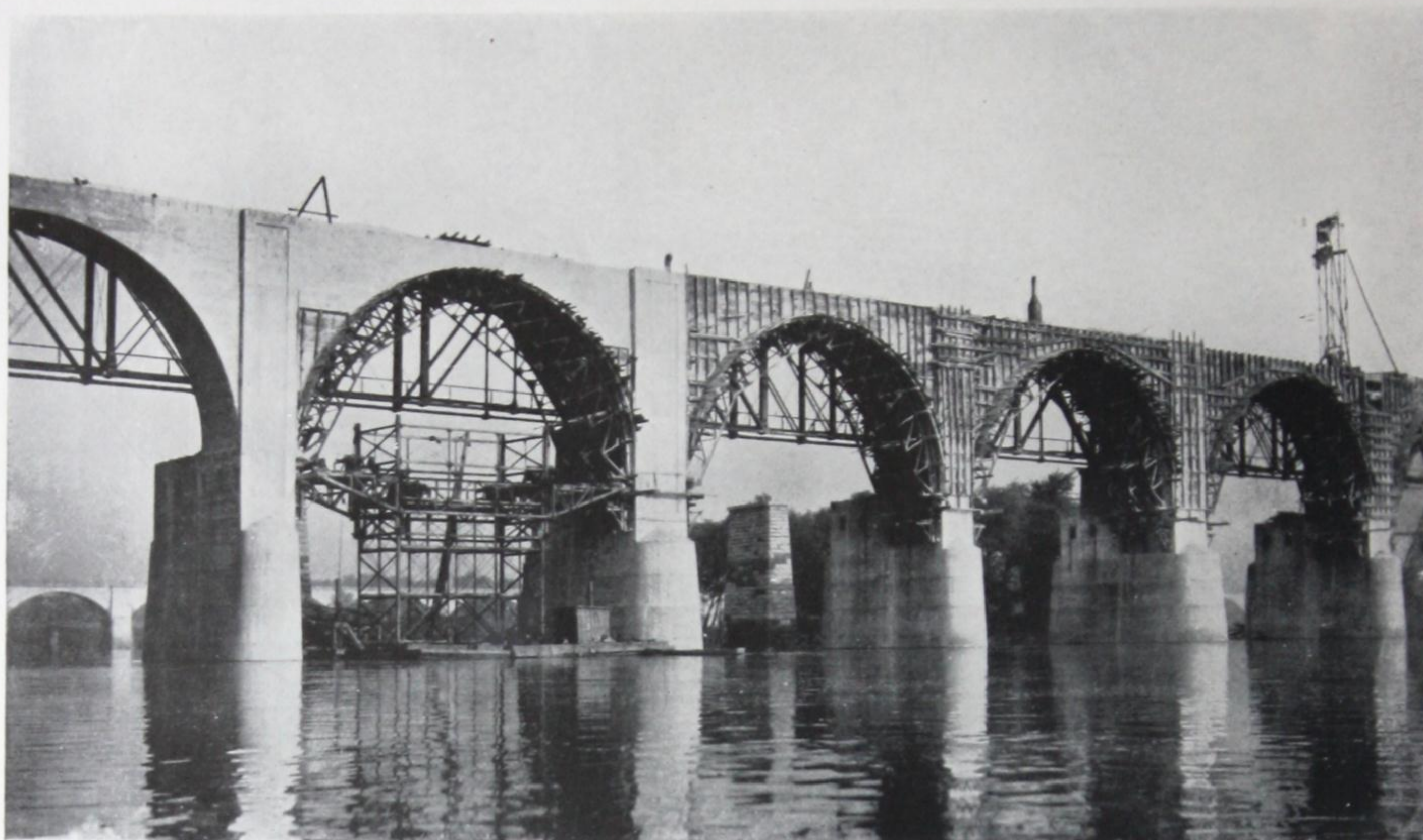


## Concrete Bridges

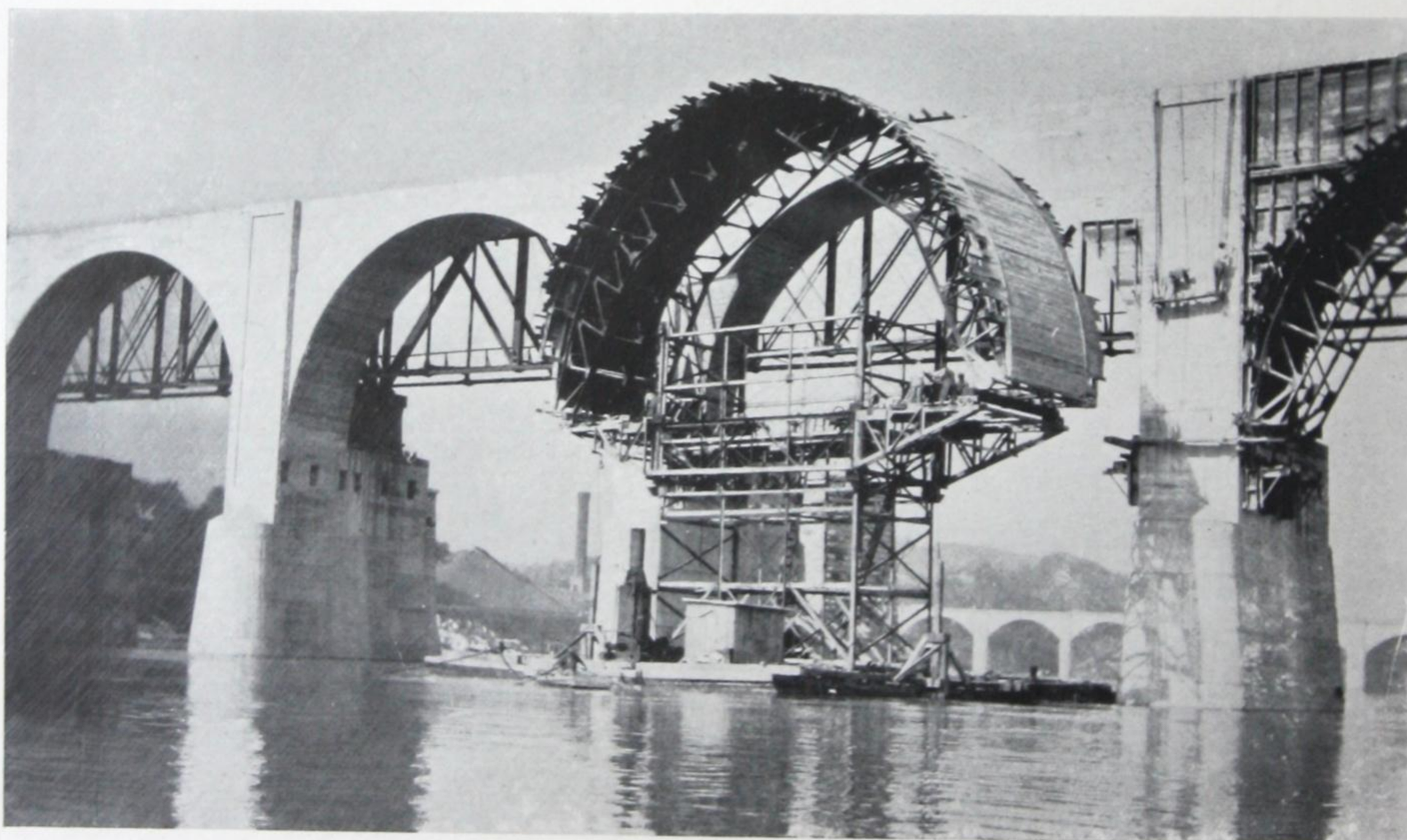
**T**HE photographs in this section illustrate the advantages gained through the use of Blaw-Knox Steel Centering. Some of the bridges illustrated could have been built only with the utmost difficulty, some not at all, without the use of steel centering.

Absolute safety is the prime requisite in the design of steel centering. The long experience of the Blaw-Knox Company, and the success with which Blaw-Knox Steel Centering has been used in the construction of so many well known bridges, insures safety with the greatest possible economy.



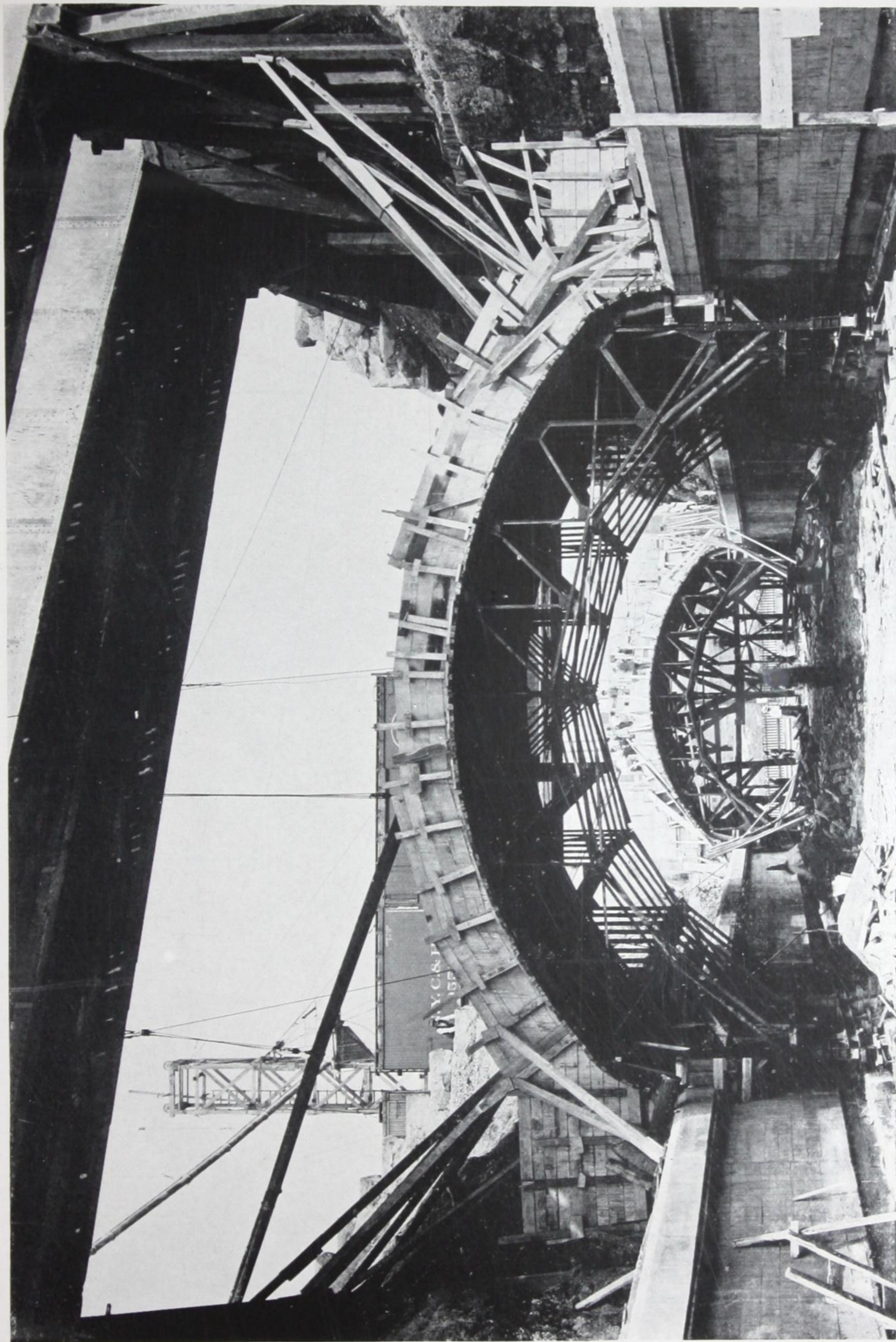


Blaw-Knox steel bridge centering in place supported on steel brackets on piers. Centering for ten spans half width of barrel arch, furnished. P. & R. Bridge No. 8, Harrisburg, Pa. James McGraw Company, contractor.



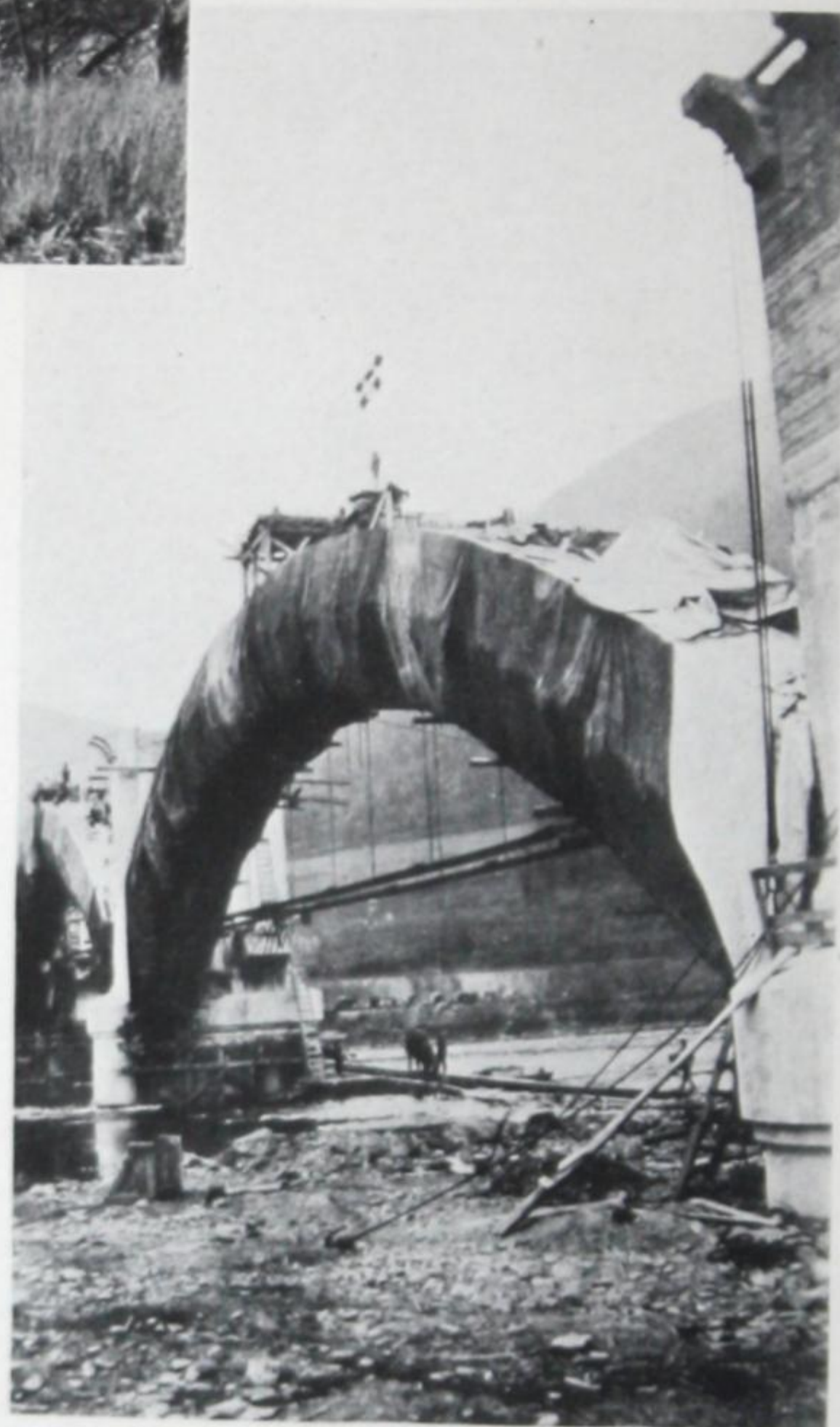
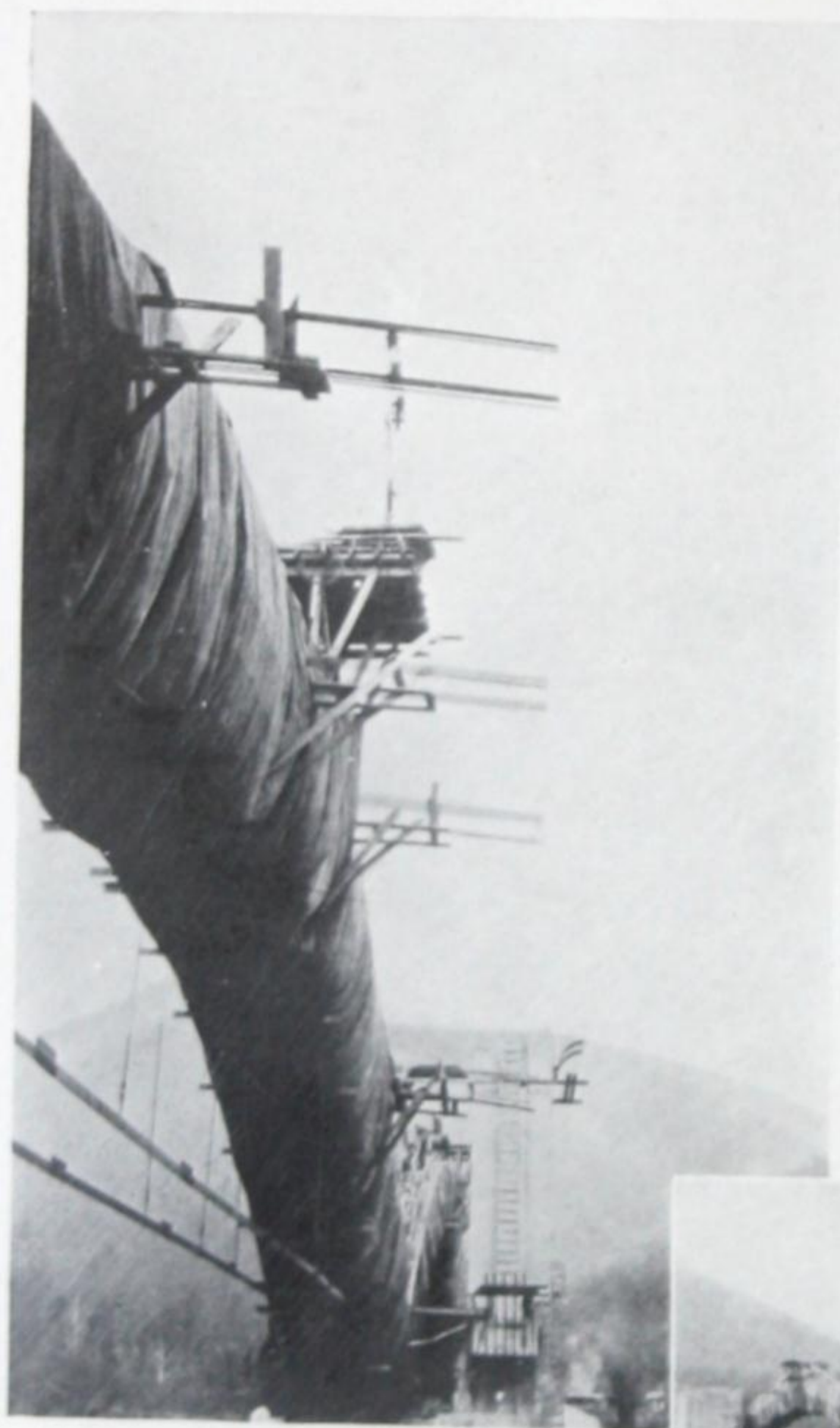
Blaw-Knox steel centering on same construction as shown in above illustration, being moved on floating equipment. A Blaw-Knox collapsible steel traveler is shown on the scows. This is used for raising and lowering centering.





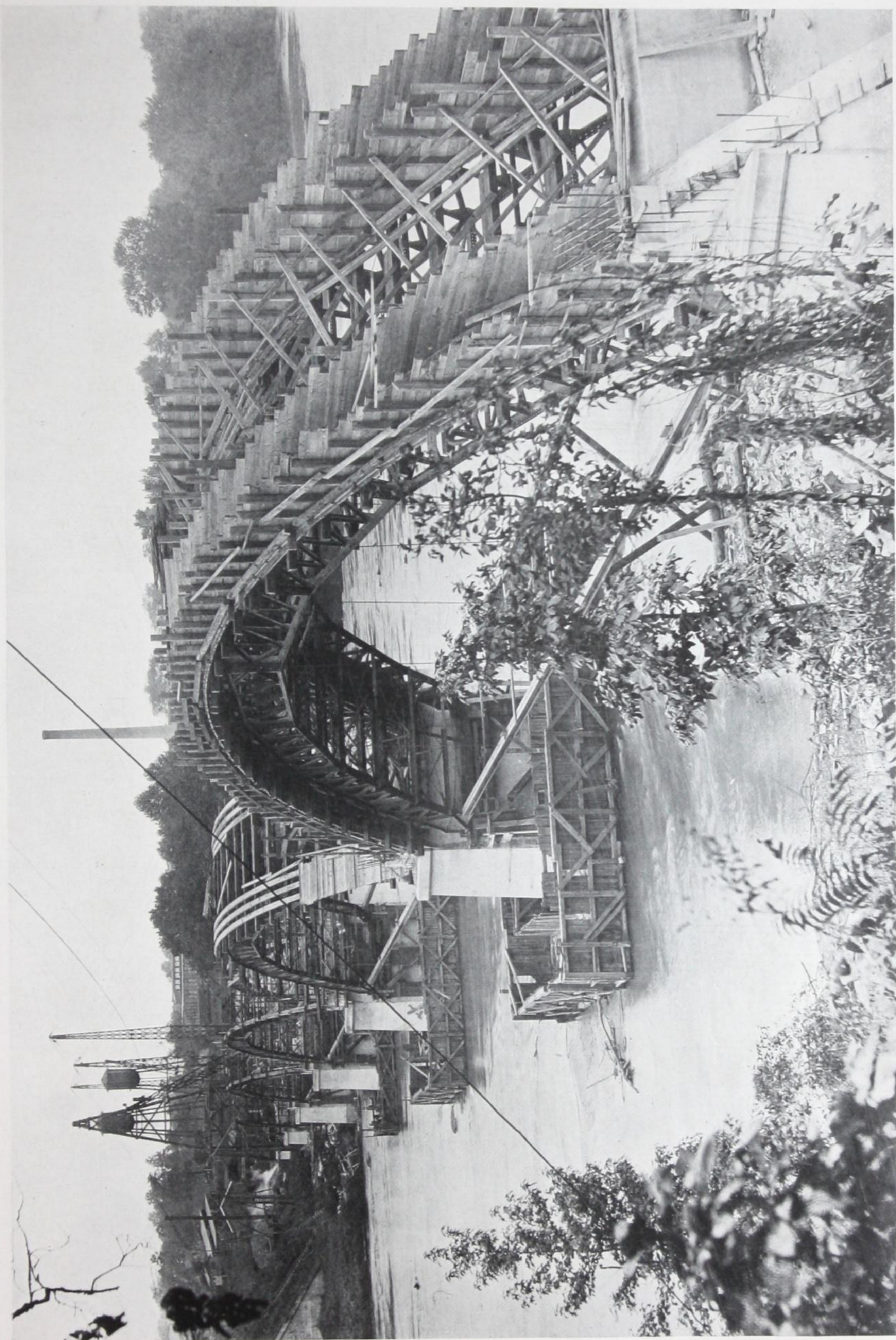
Blaw-Knox traveling steel centering with wood lagging. Corliss Street Tunnel, Pittsburgh, Pa. M. O'Herron Company, contractor.





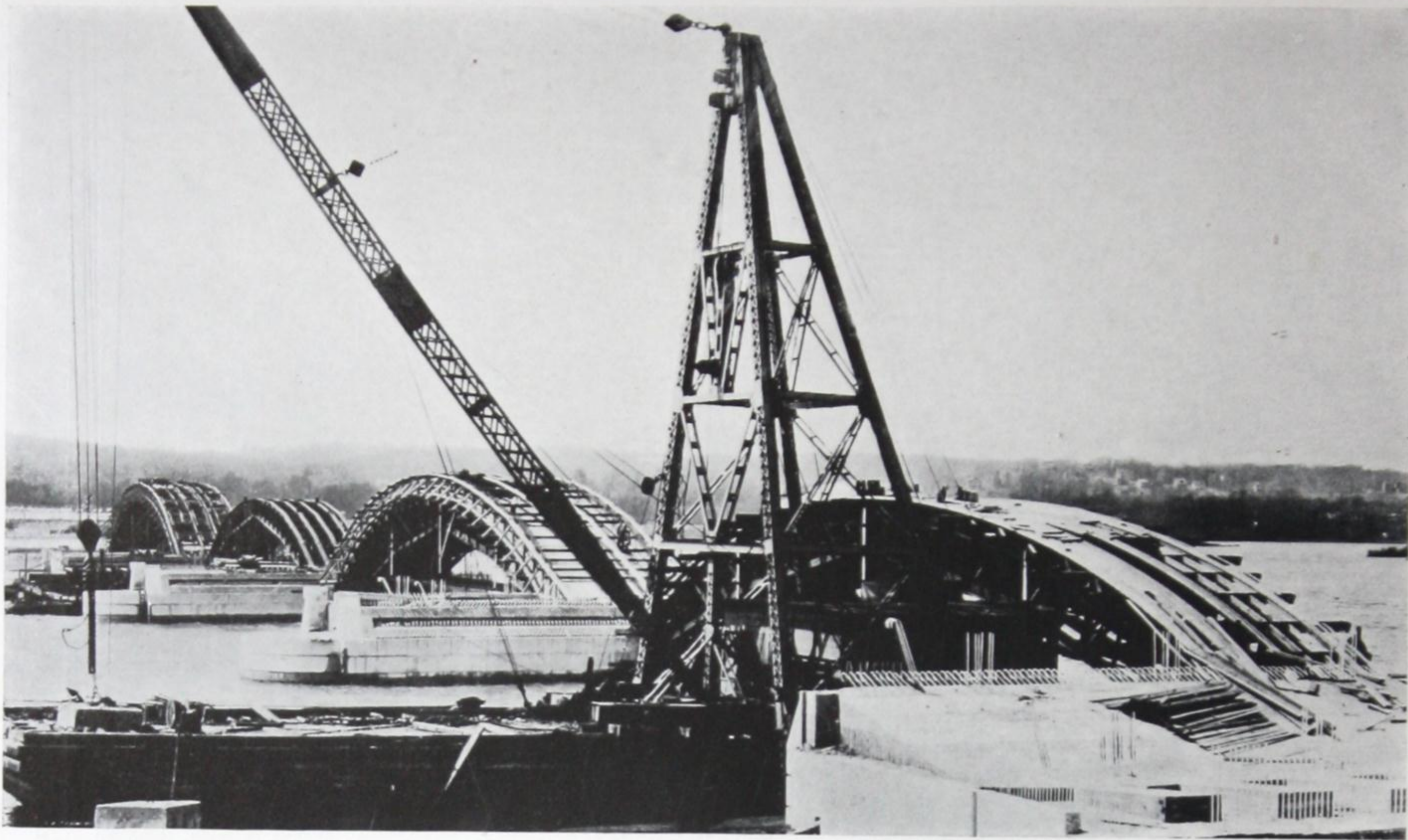
Blaw-Knox steel arch ribs used on  
 Pennsylvania State Highway Bridge,  
 Hyner, Pa. Concrete Steel Engi-  
 neering Company, contractor. Note  
 winter construction of spans.



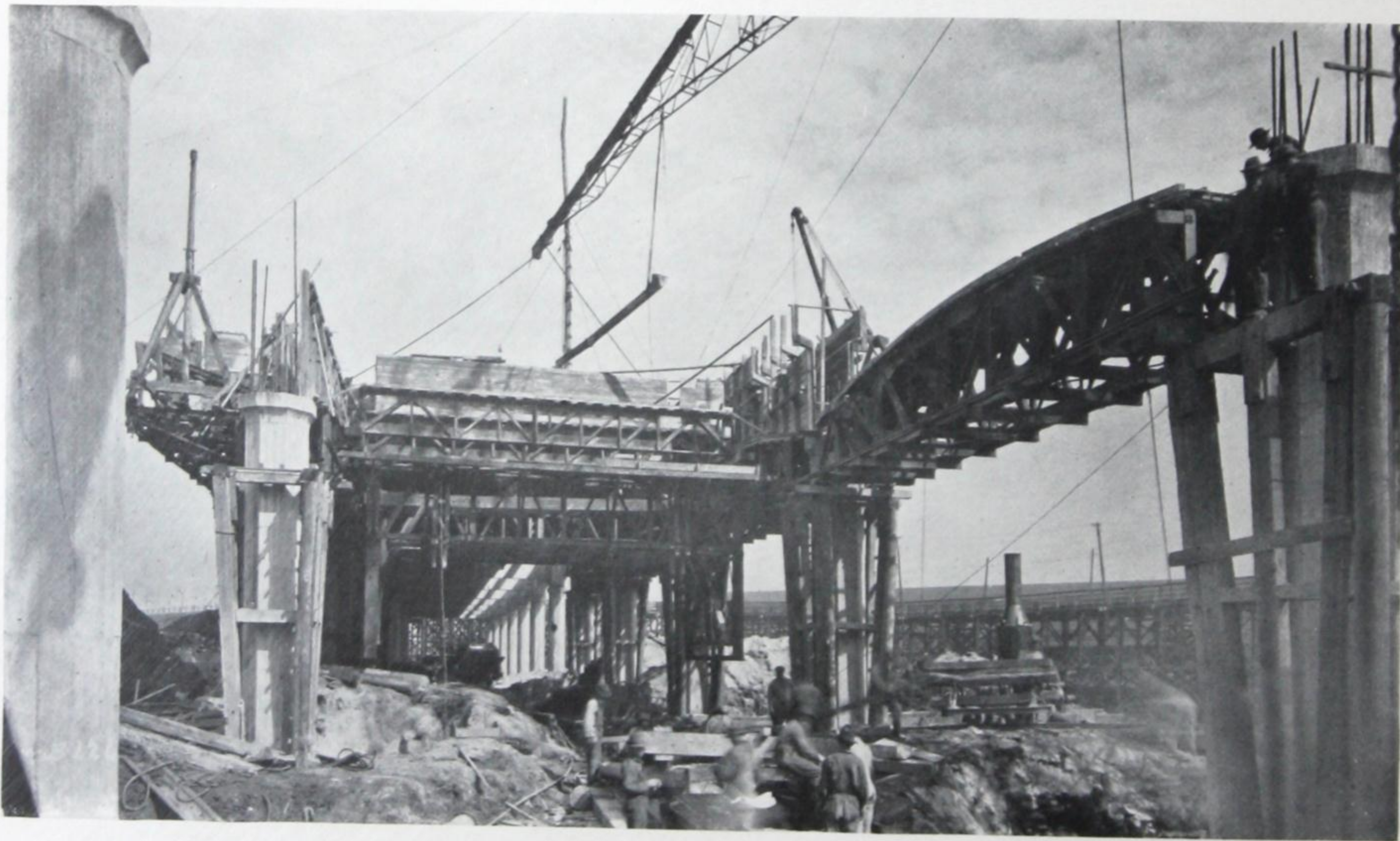


Yadkin River Bridge, Yadkin, N. C. Hardaway Contracting Company, Inc., contractor. Blaw-Knox centering furnished for full width of bridge.  
Seven 150' spans. Rib type arches.



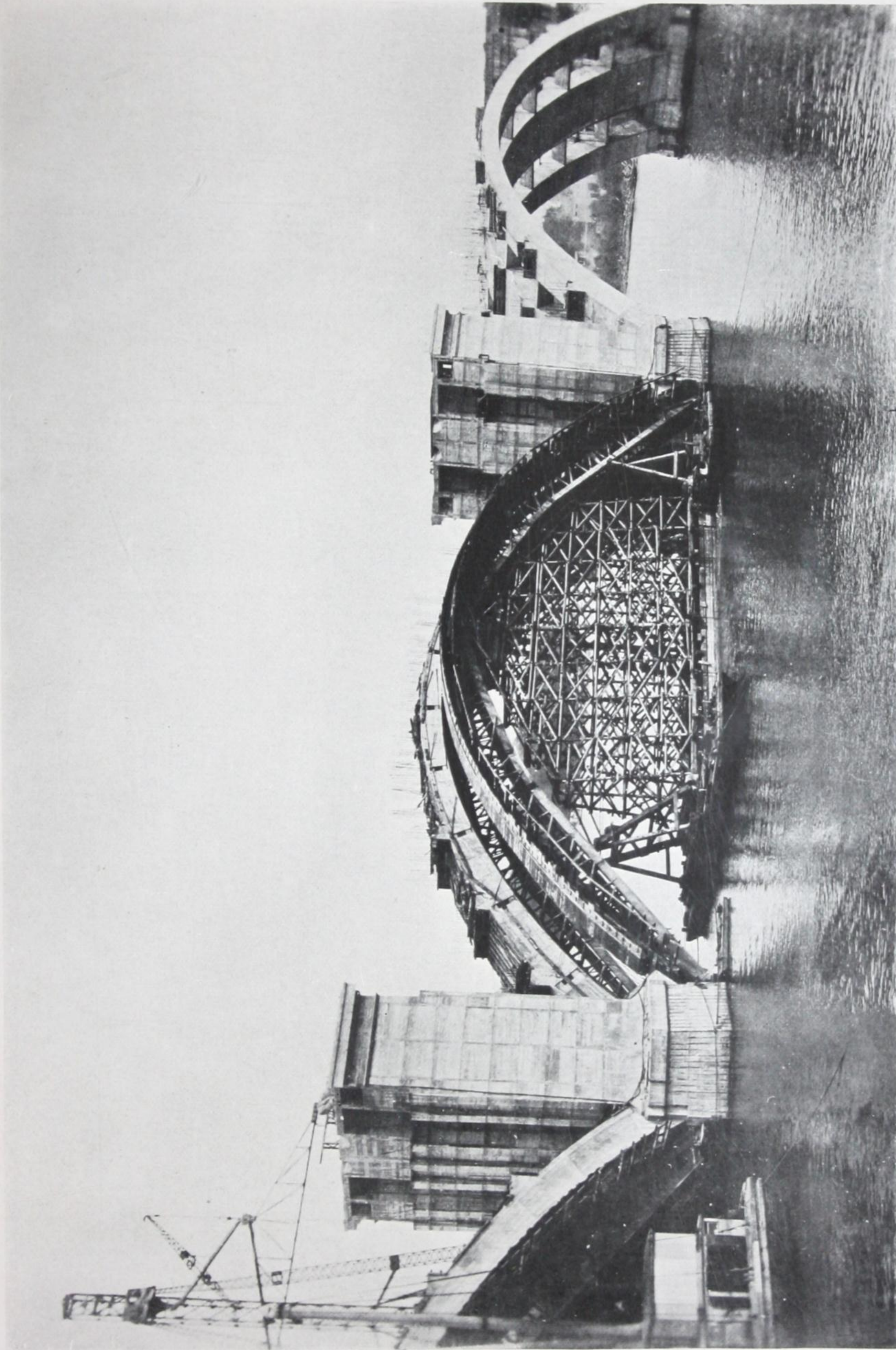


Arlington Memorial Bridge, Washington, D. C. Hunkin-Conkey Construction Company, contractor. Eight spans, barrel type arches. Minimum spans 166', Maximum spans 180', width of arch 94'. Blaw-Knox steel centering furnished for four spans one-fourth width of arch.



Lower 23rd St. Viaduct, Kansas City, Mo. The A. S. Hecker Company, contractor. Blaw-Knox steel trusses for supporting concrete and steel framework for cross beams and deck system. Collapsing traveler used for handling deck forms.





Key Bridge, Georgetown-Washington, D. C. U. S. Engineering Corps. Blaw-Knox steel centering for 208' clear spans being handled with floating equipment using tide to strike and lower centering.





Columbia-Wrightsville Bridge over Susquehanna River, Wiley-Maxon Company, contractor, showing method of erecting twin trusses on 185' spans.



Columbia-Wrightsville Bridge over Susquehanna River. Blaw-Knox Steel Centers are being rolled laterally onto construction trestle.





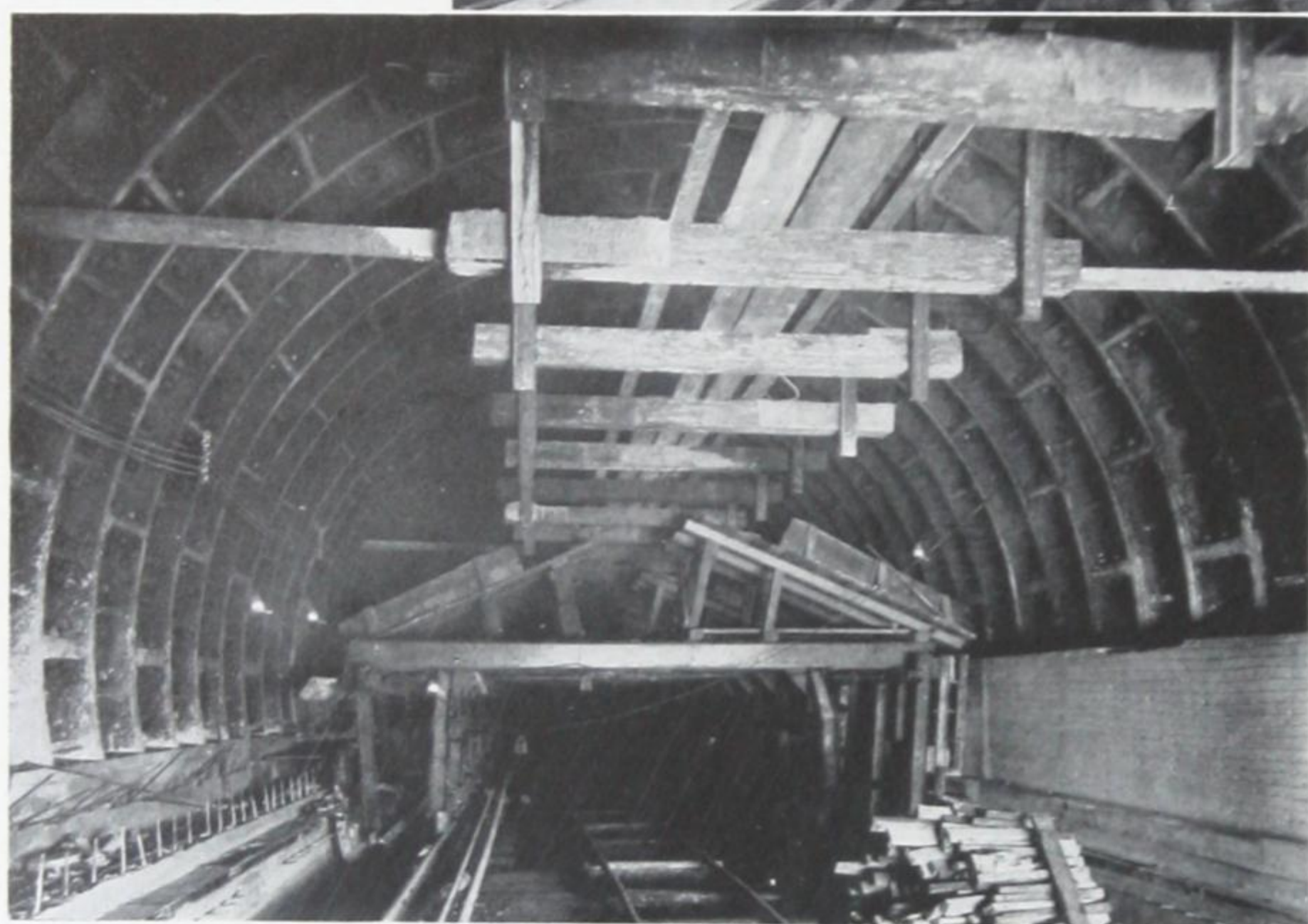
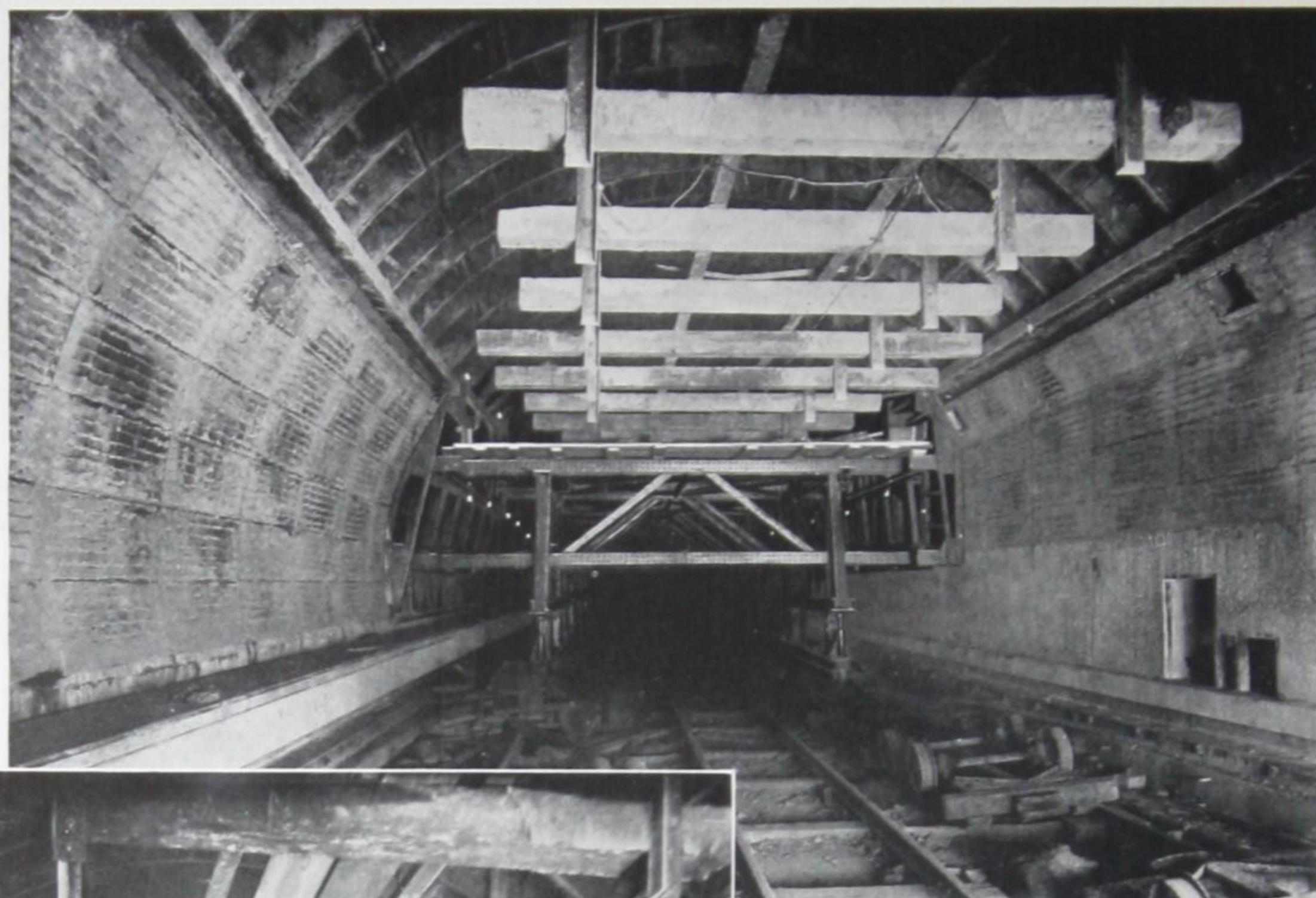
Columbia-Wrightsville Bridge over Susquehanna River. Centers being moved ahead on trestle.



Columbia-Wrightsville Bridge over Susquehanna River. Blaw-Knox Steel Centers ready to be rolled in position between piers.

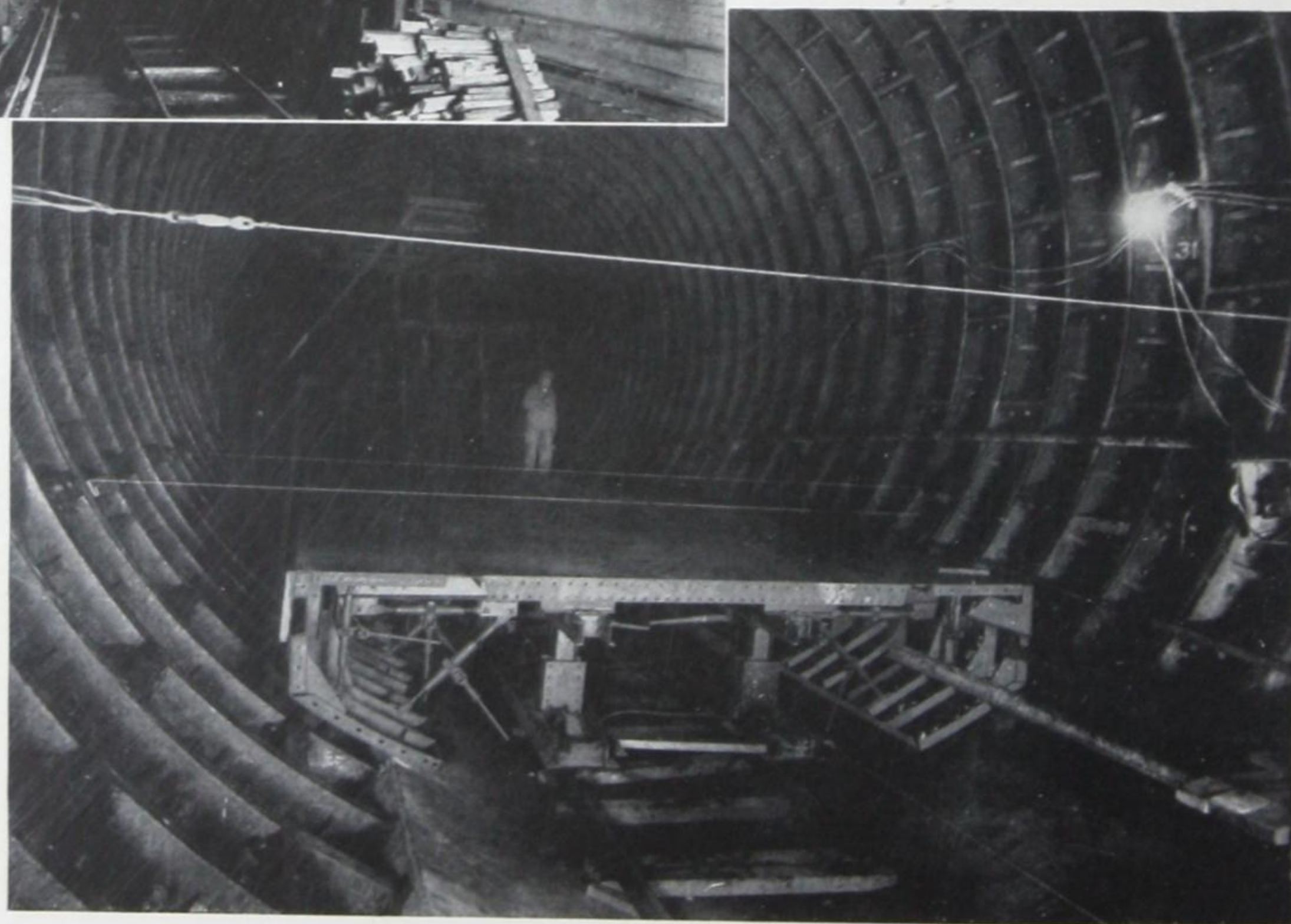


Holland Vehicular Tunnel from New York to Jersey City under the Hudson River. Booth & Flinn, Ltd., contractor. Photograph on right shows Blaw-Knox sidewall forms. See letter on page 108.

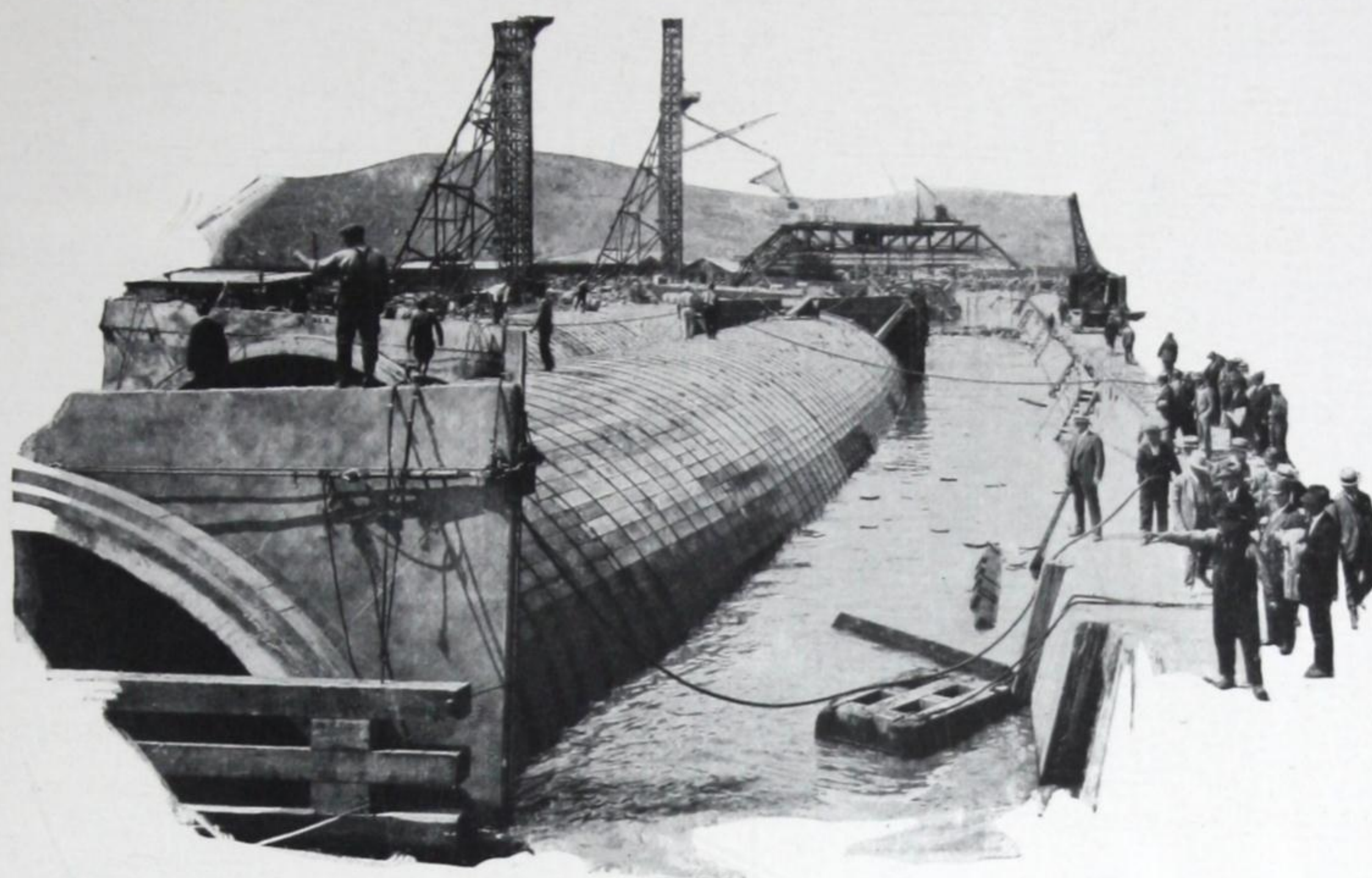


Blaw-Knox Forms for lower sidewall operation.

Blaw-Knox Forms used in casting roadway slab.







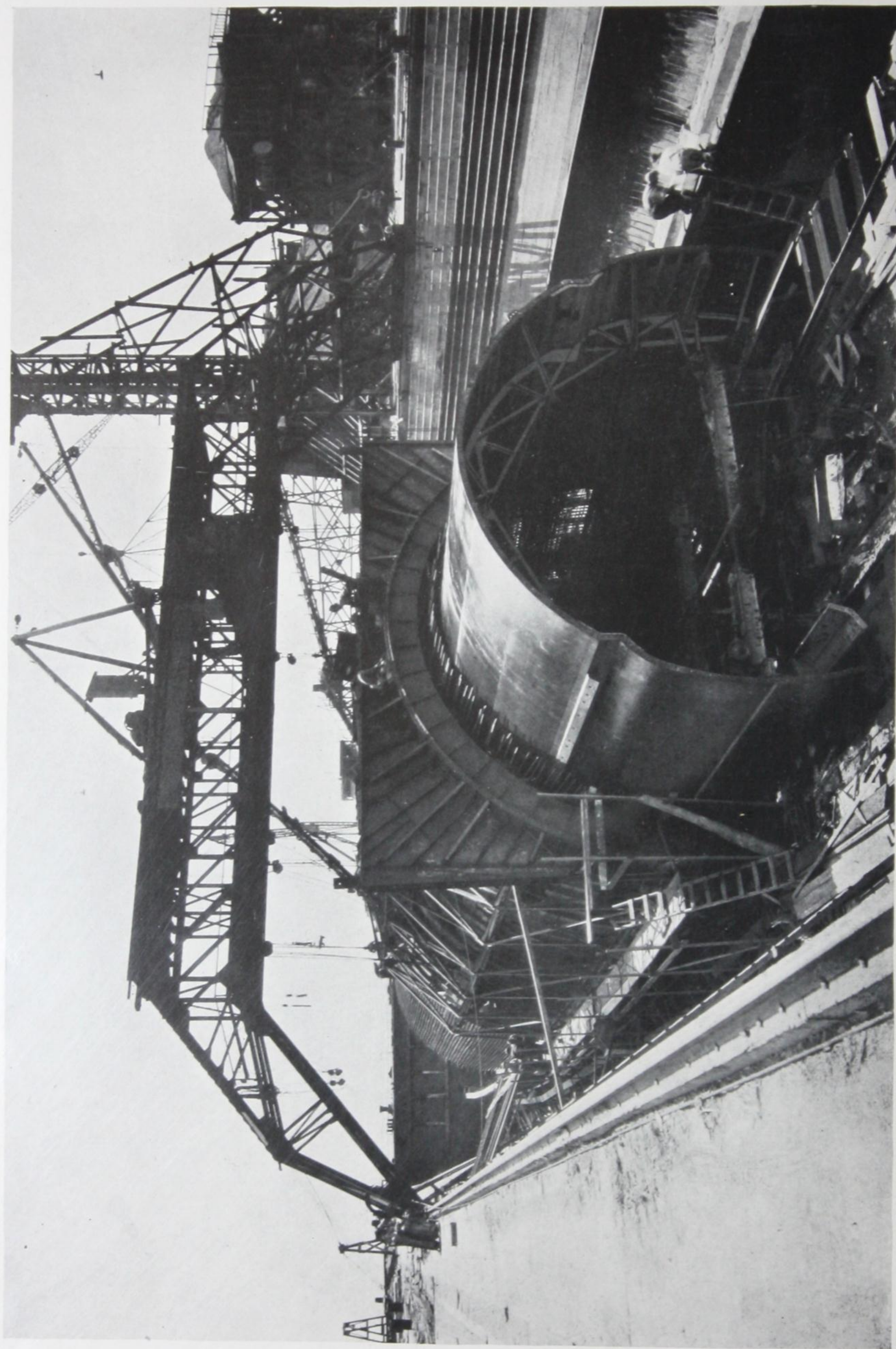
## Traffic Tubes

THE photographs used in this section are confined to views of the two outstanding structures in the United States—the Holland Tube between New York and New Jersey, and the Estuary Tunnel between Oakland and Alameda, California.

Entirely different methods were used in the design and construction of these tunnels, necessitating separate and distinct types of Blaw-Knox Steel Forms, each designed to meet job specifications and conditions.

The Blaw-Knox Company is prepared to supply designs and service in connection with vehicular tunnel forms to any engineer, municipality or contractor interested.

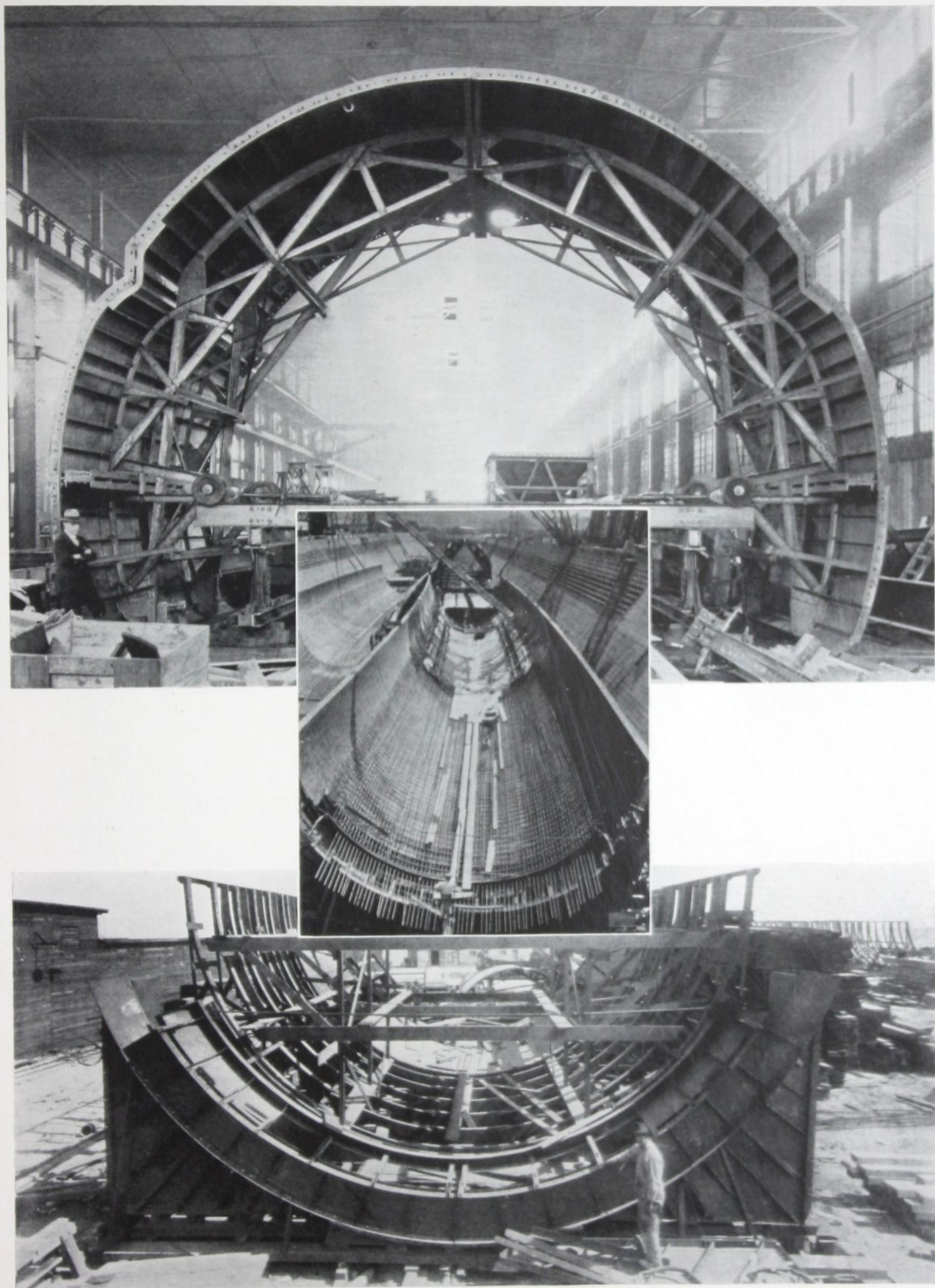




Photographs on this page and page 77 show various views of Blaw-Knox Steel Forms used in construction of the Estuary Tunnel, between Oakland and Alameda, Cal. California Bridge and Tunnel Co., contractor. Forms 32' inside diameter. Sections of 203' were cast in dry dock, floated to position, sunk, and connected under water.

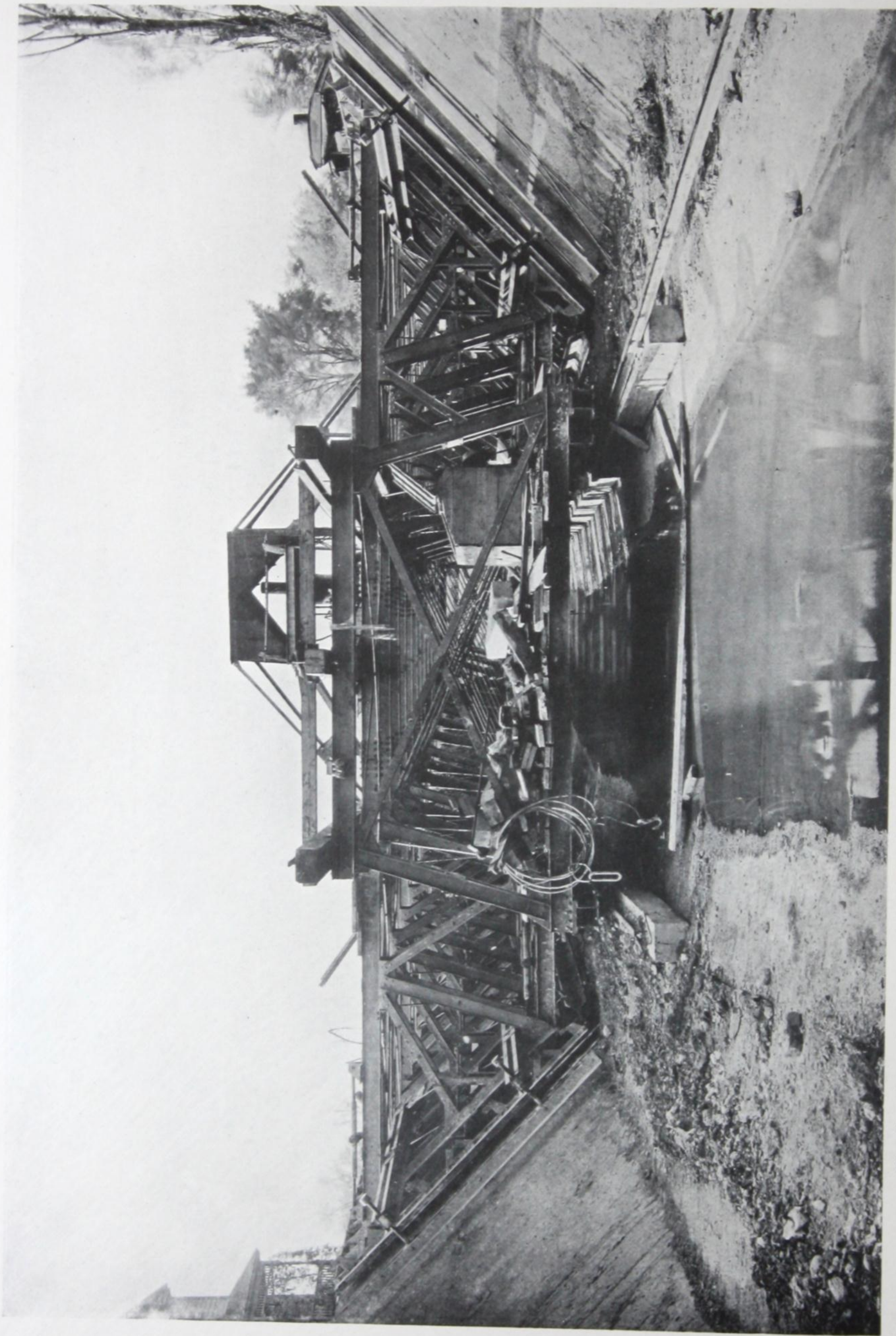






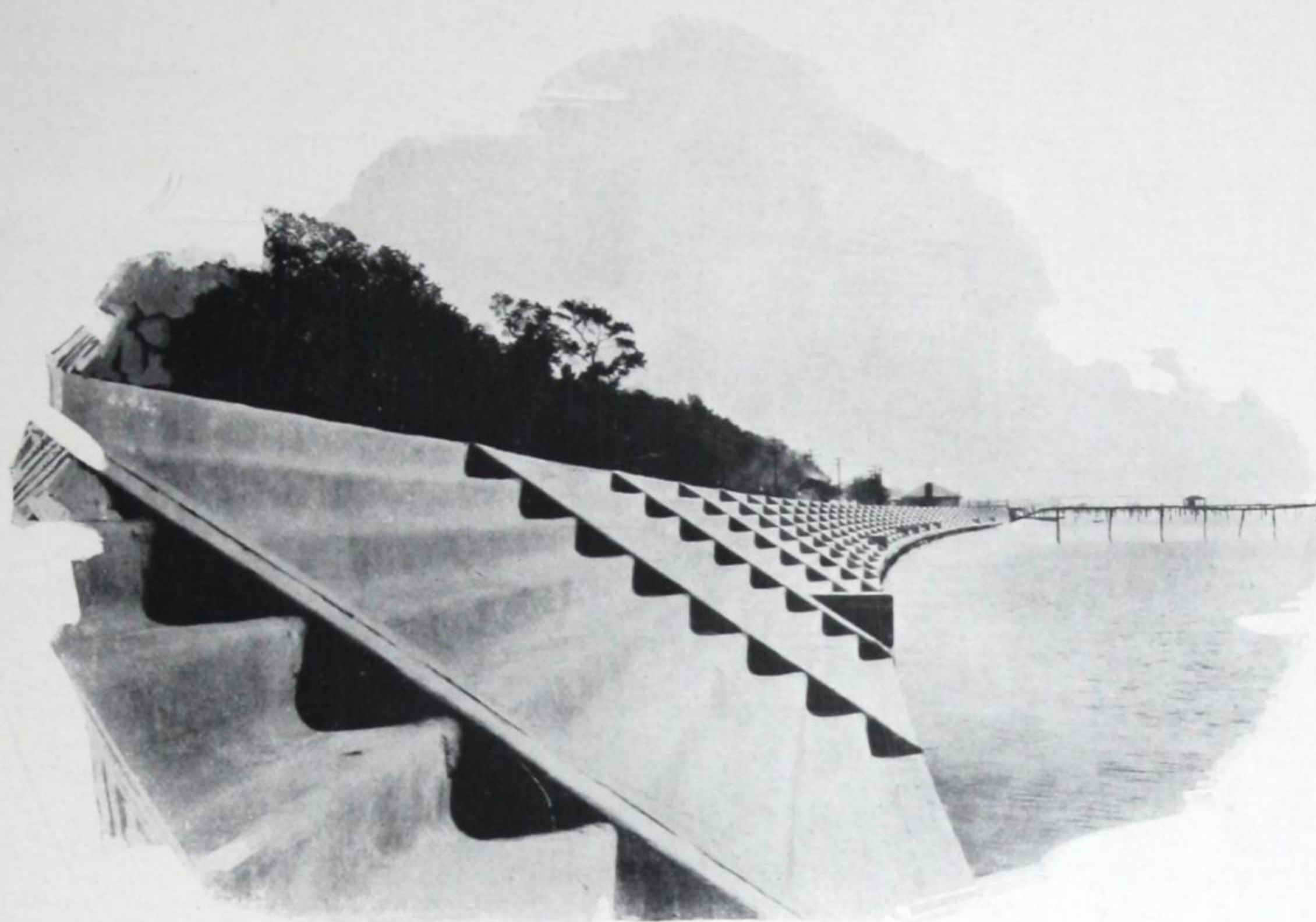
(Upper) Section of inside crown forms. (Middle) Various progress operations. (Lower) Section of invert form with bulkheads attached.





Blaw-Knox Flume Forms 48' wide used in construction of Onondaga Creek Improvement, Syracuse, N. Y. John Young Company, contractor.





## Miscellaneous Concrete Structures

**T**HERE are grouped under this heading a series of photographs illustrating the use of Blaw-Knox Steel Forms in the construction of filtration plants, canals, sewage disposal plants, caissons, coal pockets and river walls, etc.

Where the design of the structure and the speed of construction permits a reasonable number of re-uses, Blaw-Knox Steel Forms can be employed to great advantage.



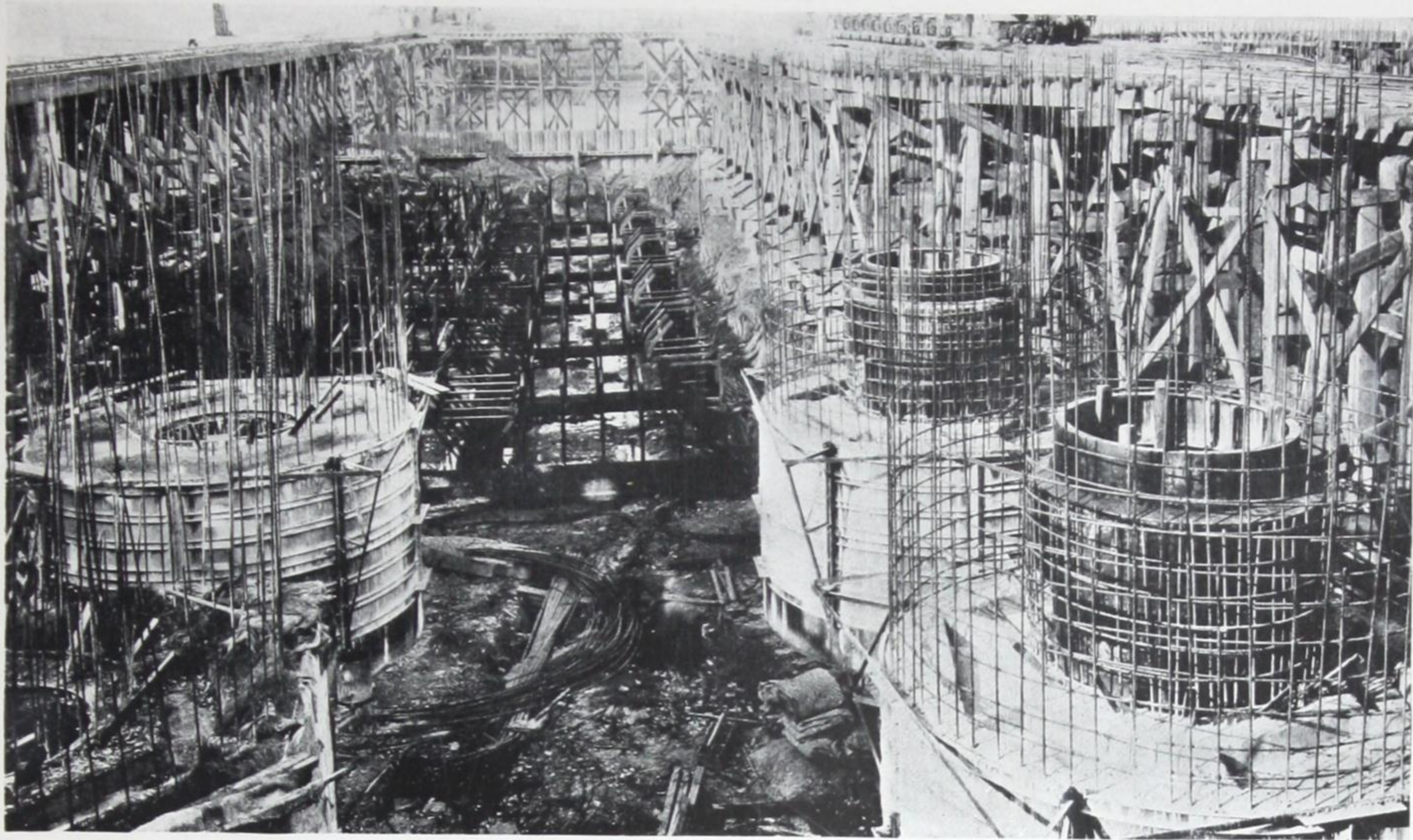


Blaw-Knox Deck Forms supported from steel work by means of special latches. Port Authorities Bridge, Perth Amboy, N. J. Cornell Contracting Company and Albert A. Volk Company, contractors.

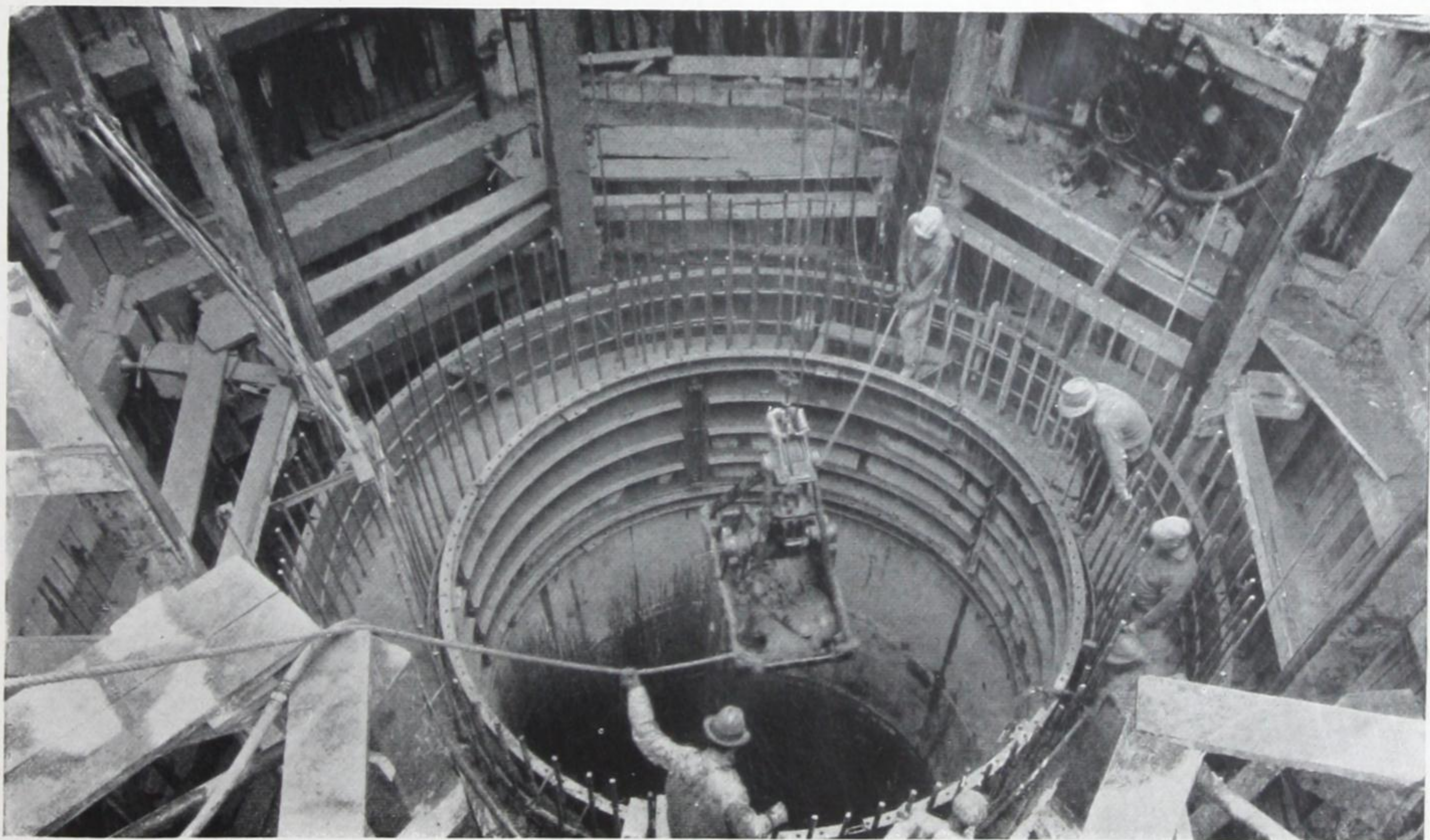


Another view of the above.



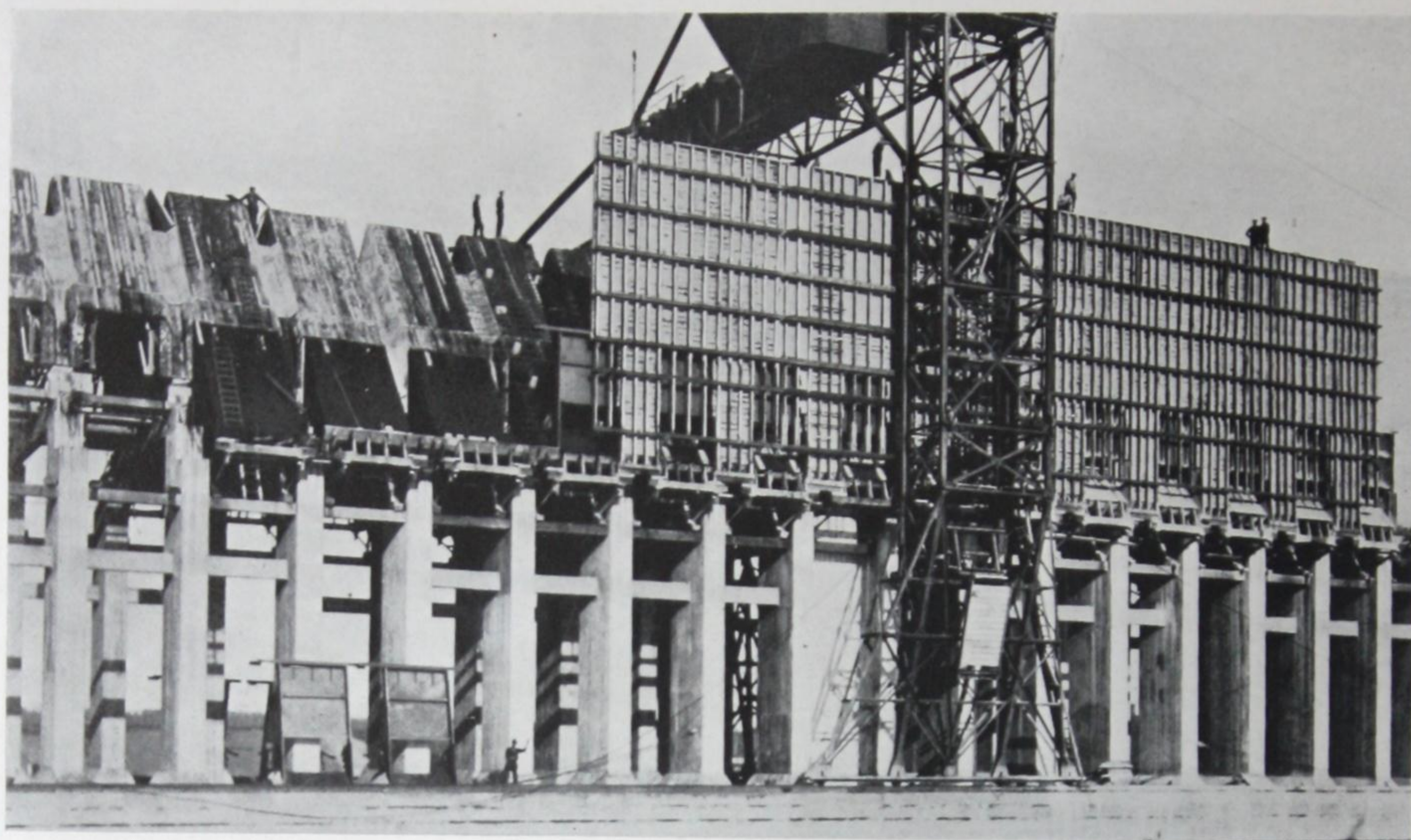


Blaw-Knox caisson forms used in construction of Delaware River Bridge between Philadelphia and Camden.  
Contractors—Keystone State Construction Company, and Holbrook, Cabot and Rollins.

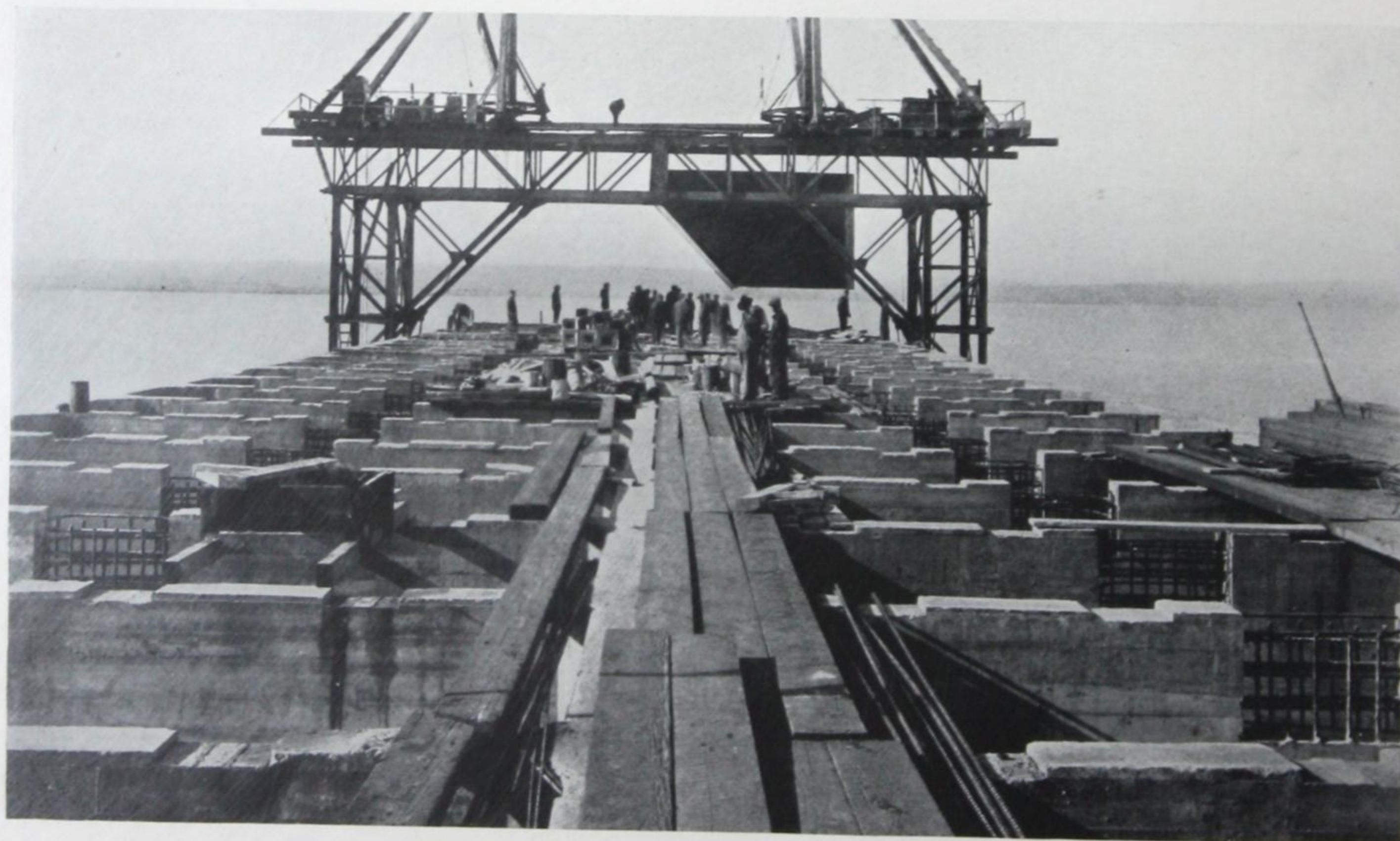


Close-up of caisson.





Soo Ore Dock Extension, Ashland, Wis. Foley Bros. Inc., contractor. This extension is 59' wide and 73' high. A steel traveler mounting two derricks handles both pocket and face forms. Bottom forms, not shown by photograph, were of the telescopic type and were handled by means of steel traveler.

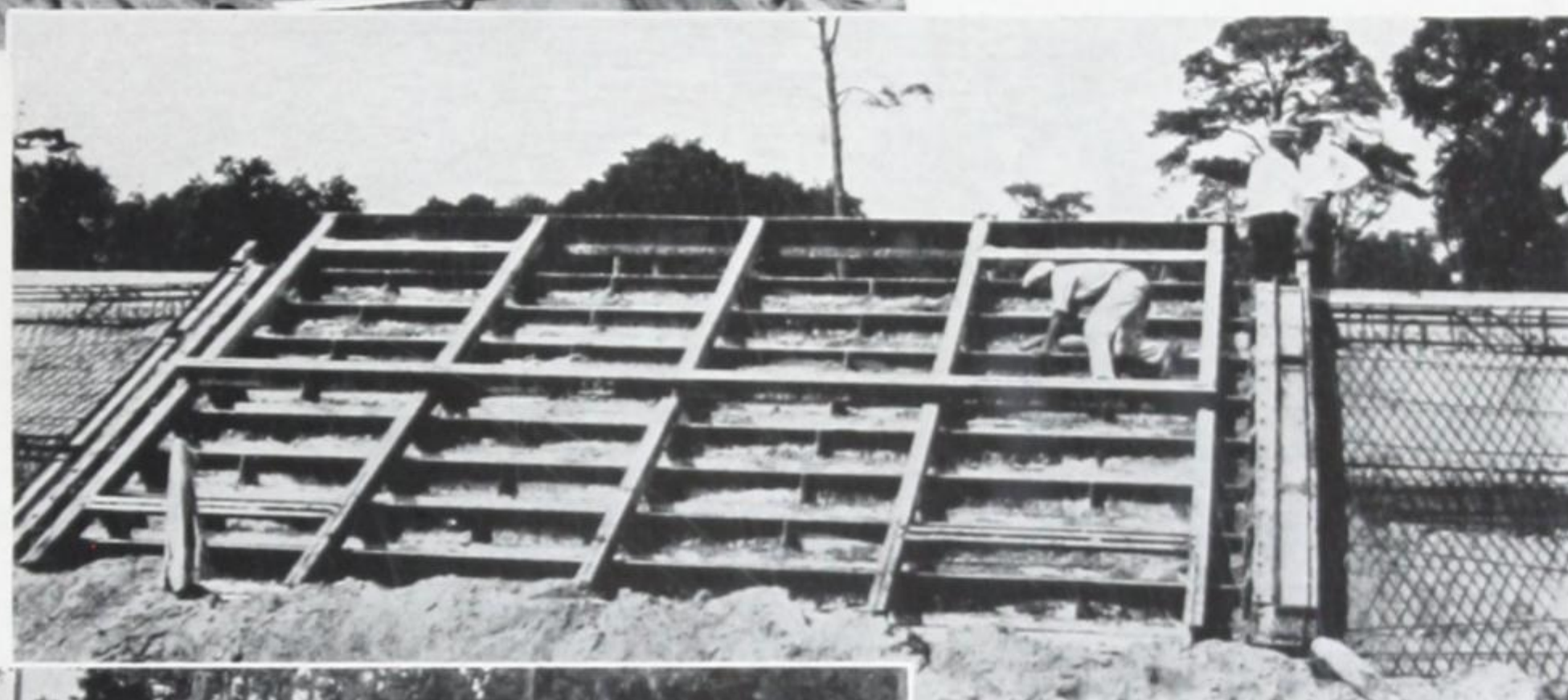


Traveler handling pocket forms.





Blaw-Knox 25' slope form used by Duquesne Construction Company, building coal pocket.



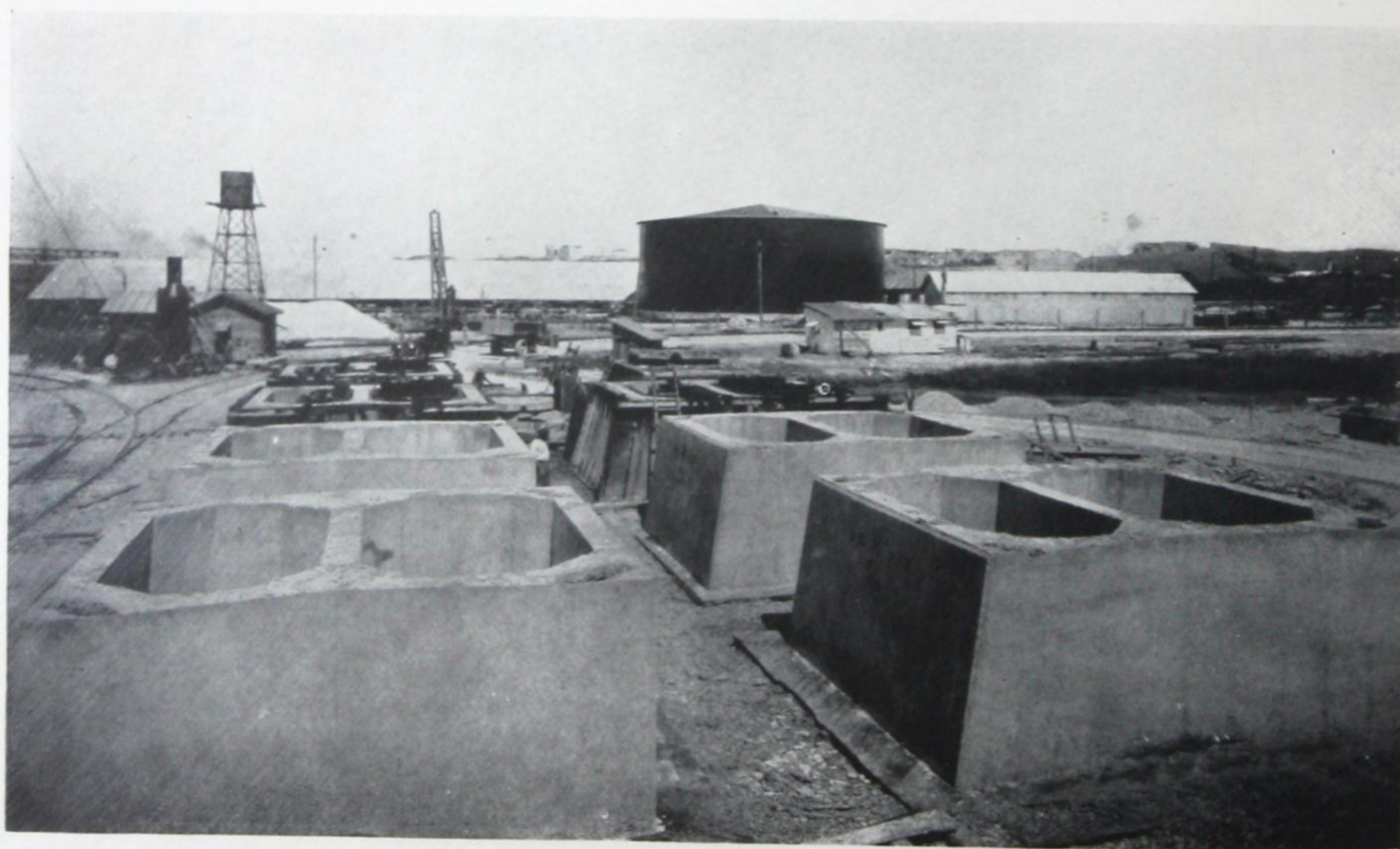
Typical Blaw-Knox sea wall forms in use by Pryor, Oman & Co., Delta Cement Tile Co., and Woods Bros. Construction Co.





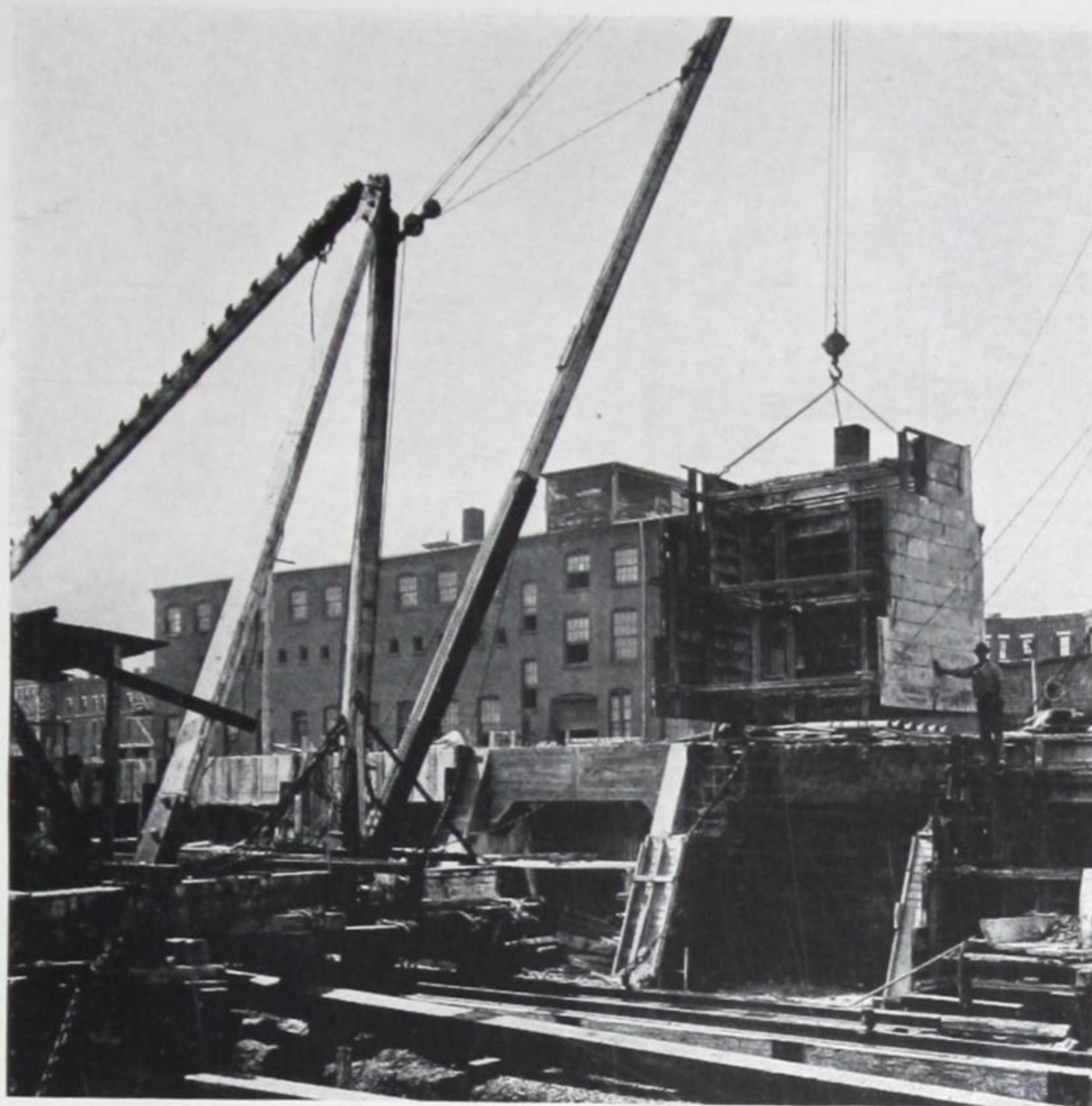


Blaw-Knox block molds for precasting sections of concrete sea wall. Malecon Wall, Havana, Cuba.  
Arellana & Mendoza, contractors.

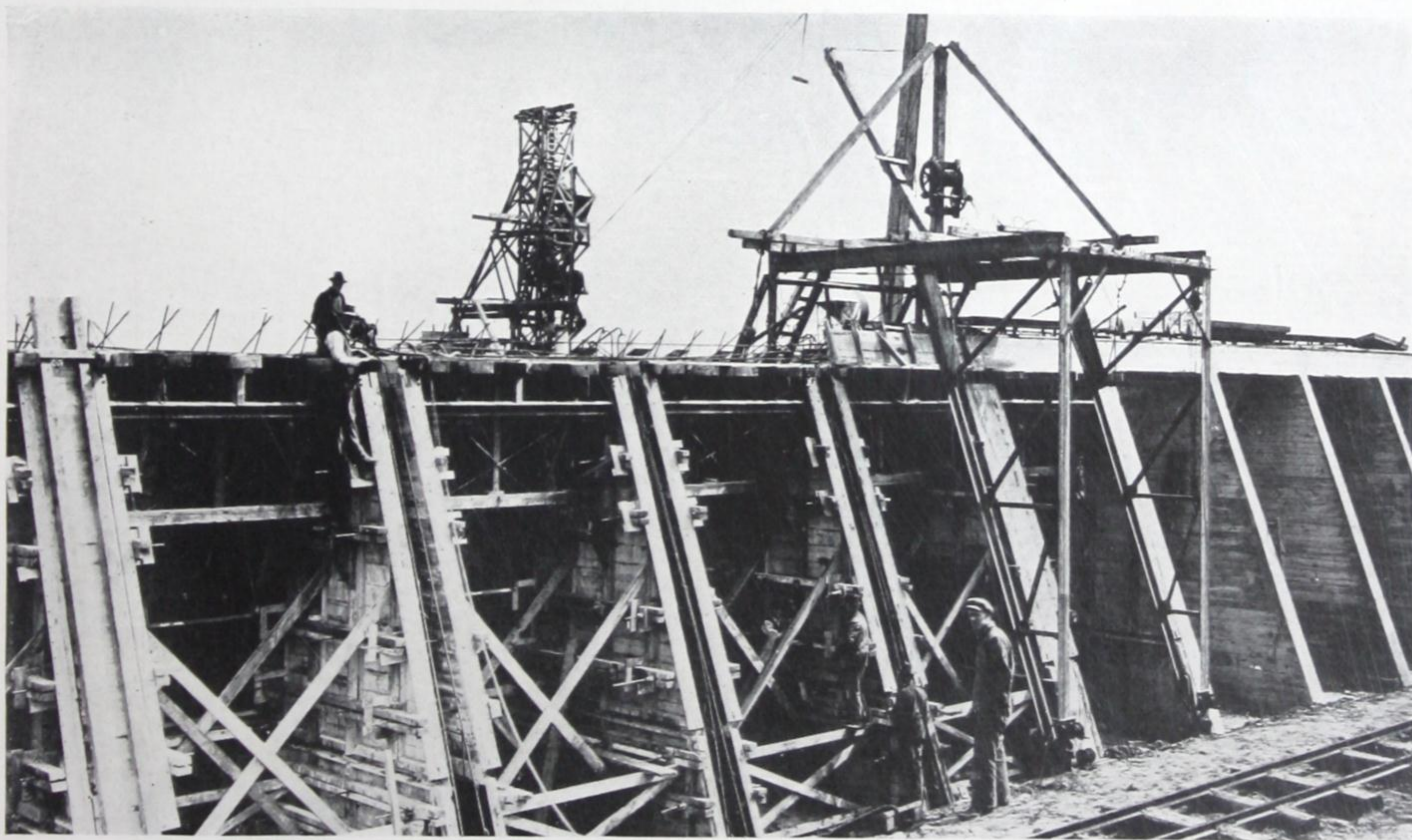


Finished concrete sea wall blocks after stripping forms.





Counterfort Wall at Holyoke, Mass. Casper Ranger Construction Company. Blaw-Knox counterfort wall form 16' high with 16" counterforts at 14' 11" centers. This type of form is a box-like design with arrangements for collapsing so that forms for a pocket can be handled as a unit.



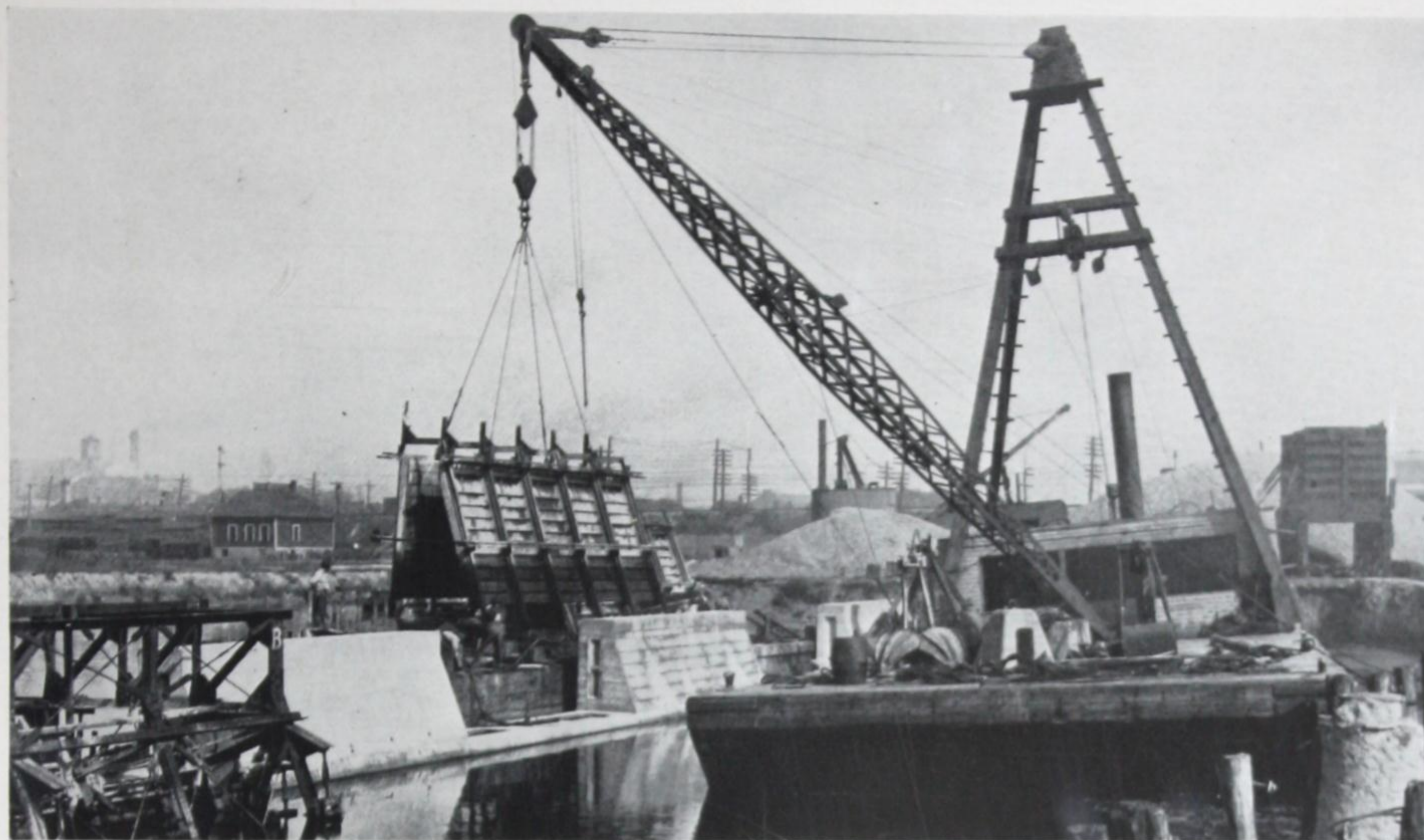
St. Paul Reservoir, St. Paul, Minn. George J. Grant Construction Company, contractor. Blaw-Knox counterfort wall form with steel traveler for handling pocket forms.



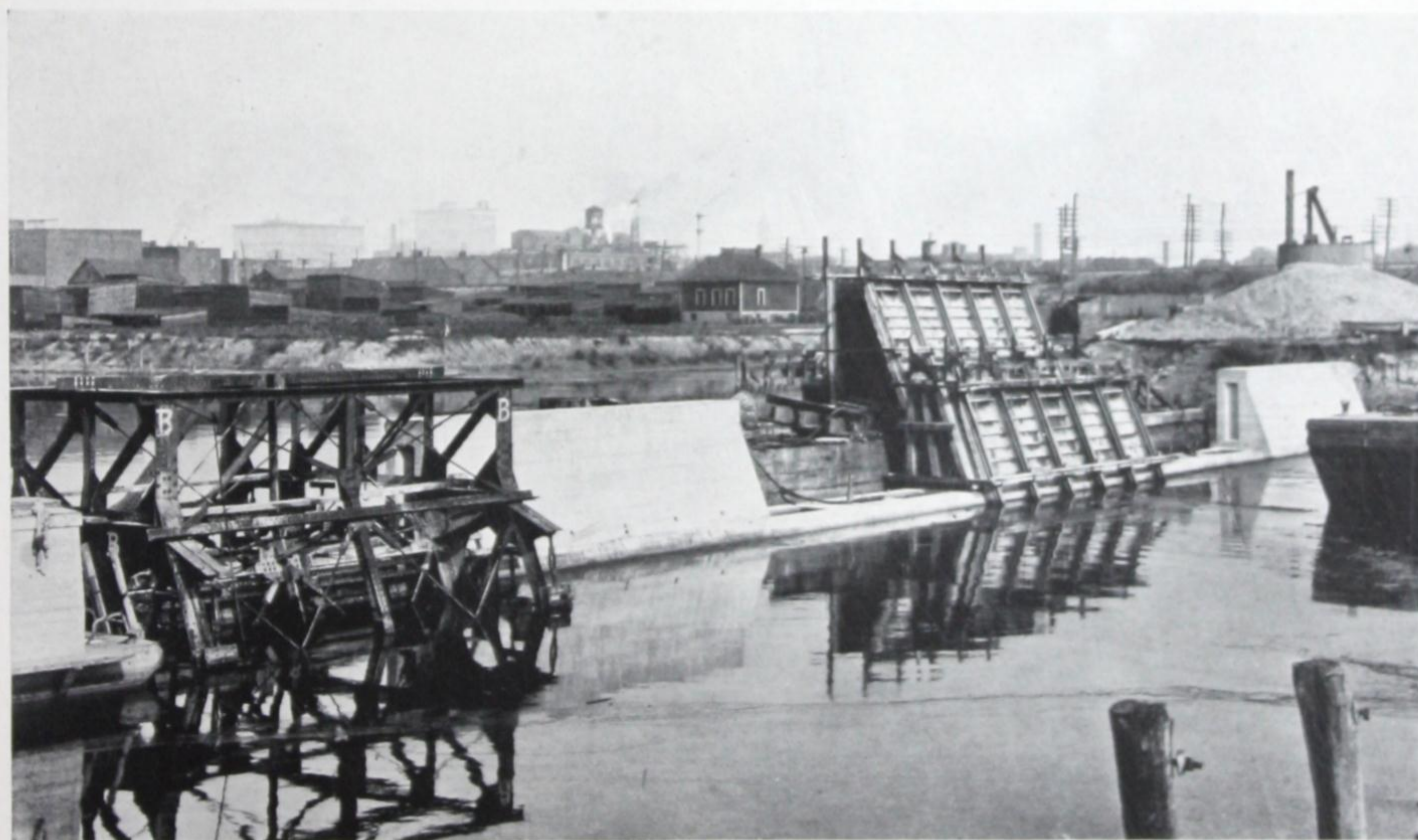


Blaw-Knox submarine type of wall forms. Maximum height 27'. Adjustable feet provide for variation of bottom. This type of form requires a minimum of work on the part of divers. One 25' unit with bulkheads and one 25' unit without bulkheads furnished on this construction. N. Y. Barge Canal Terminal, Ohio Basin, Buffalo, N. Y. Great Lakes Dock and Dredge Company, contractor.



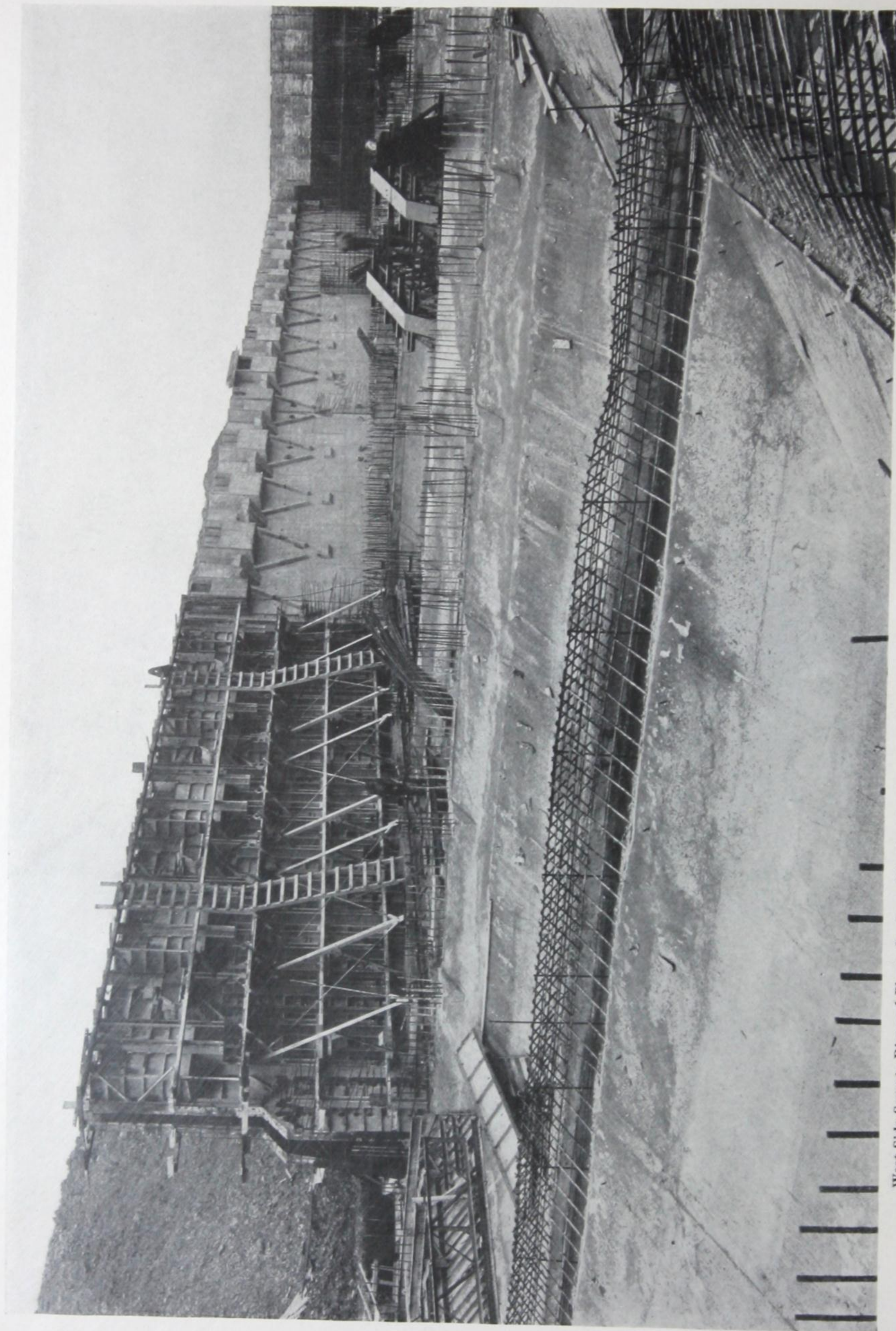


Section of Blaw-Knox wall forms used for casting 11' upper portion of wall described on page 86.



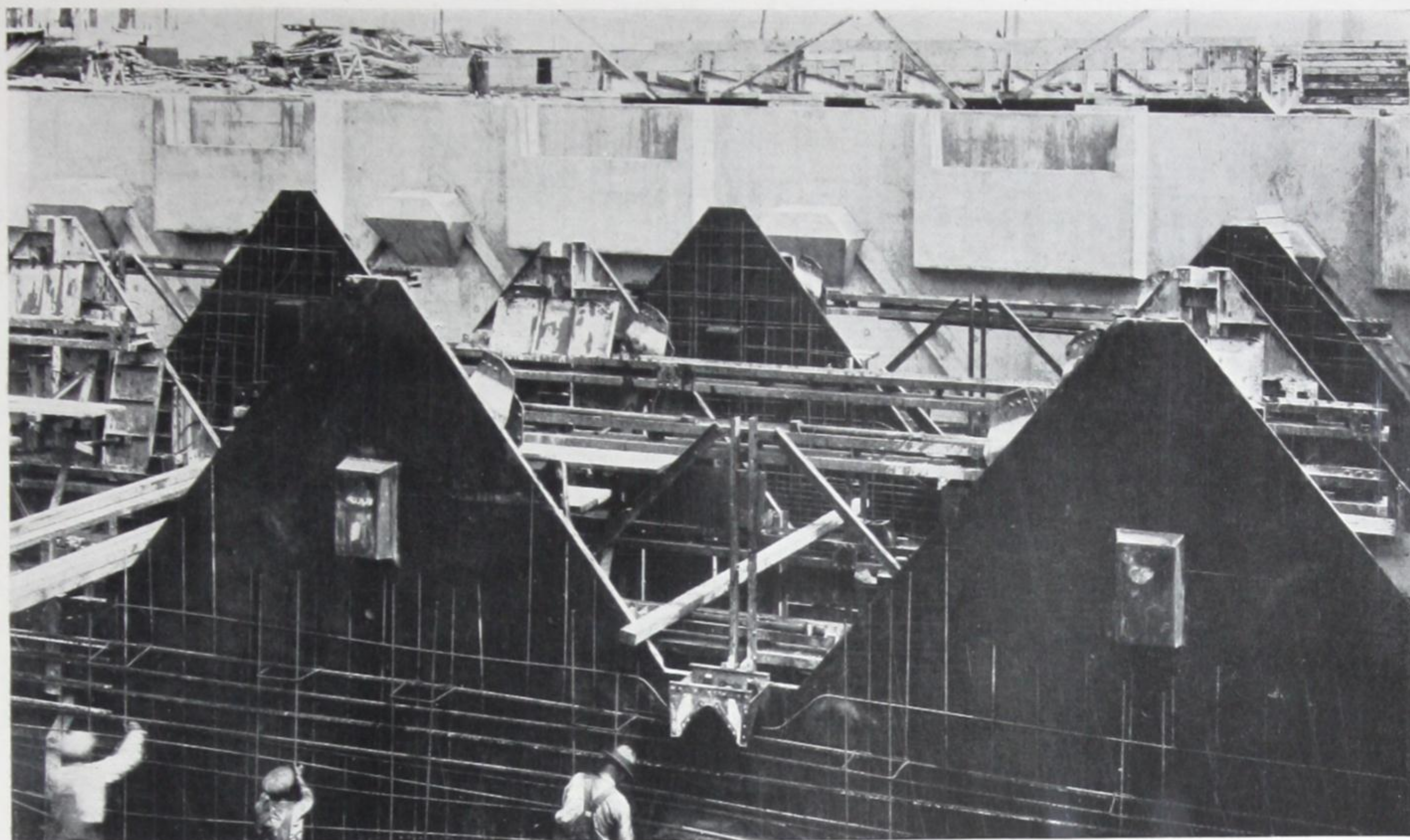
Submarine form in place, see page 86 for details.



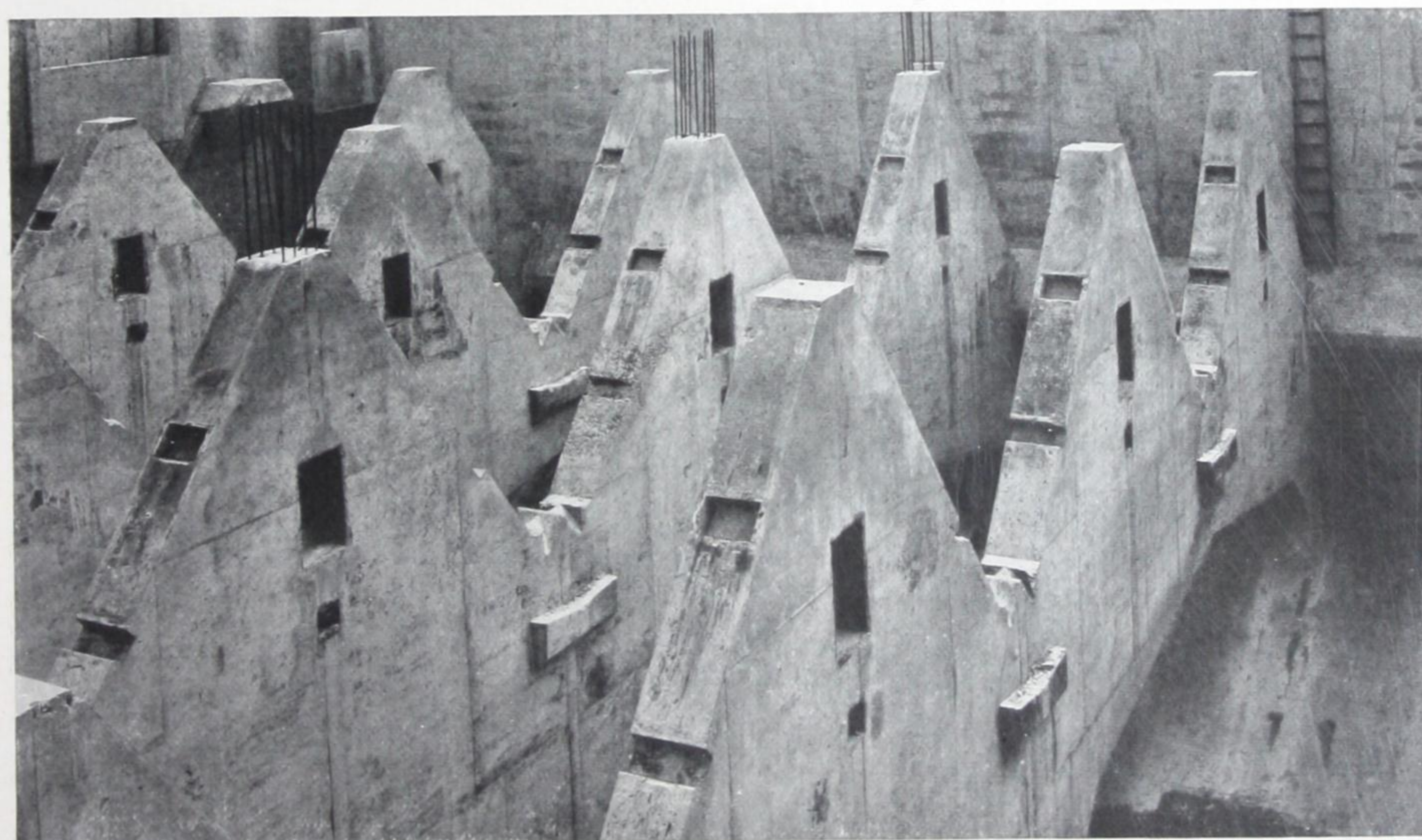


West Side Sewage Disposal Plant, Sanitary District, Chicago. T. J. Forscher Contracting Company, contractor. 36 Imhoff Tanks 80' x 80'. Photograph shows Blaw-Knox steel forms on one of the outside walls showing brackets, corbels, wler boxes, etc., cast in one operation. Walls were 25' high, 87' section of this wall was poured by means of cable way and seven-yard bucket in forty minutes,



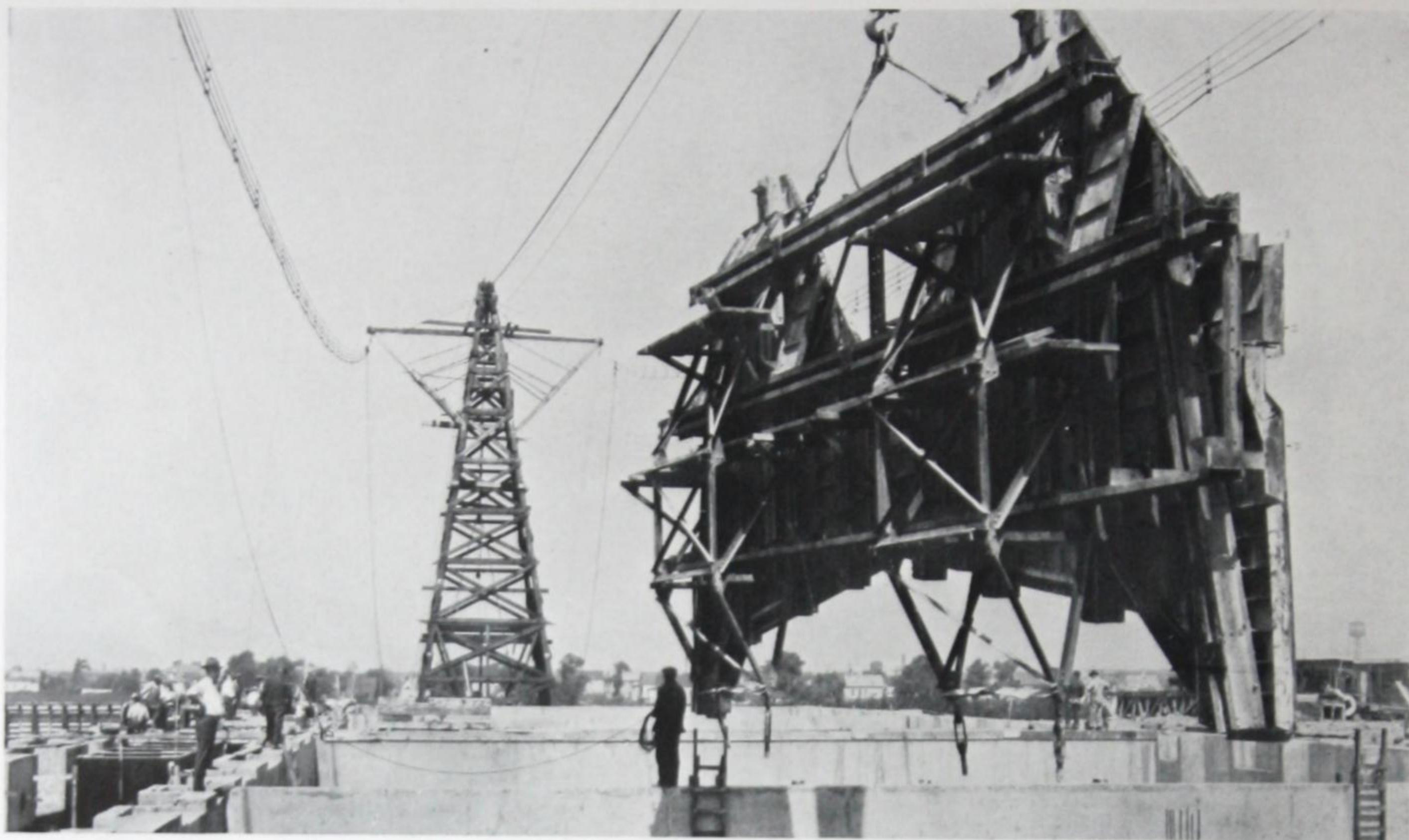


Setting Blaw-Knox Forms for cross walls in Imhoff Tanks. See page 88 for full description.

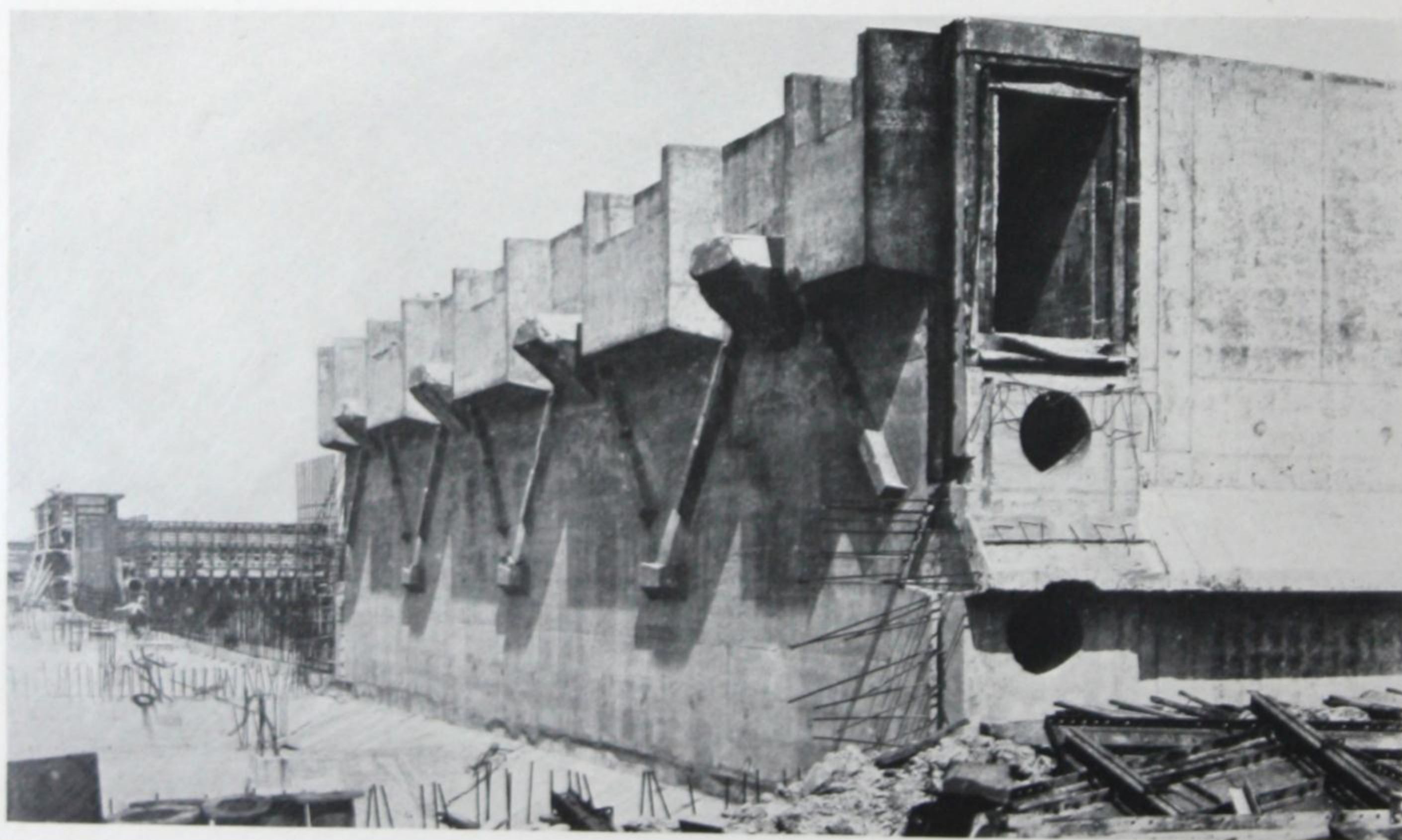


Completed cross walls. Note openings, brackets, etc., which were cast in one operation. See page 88.



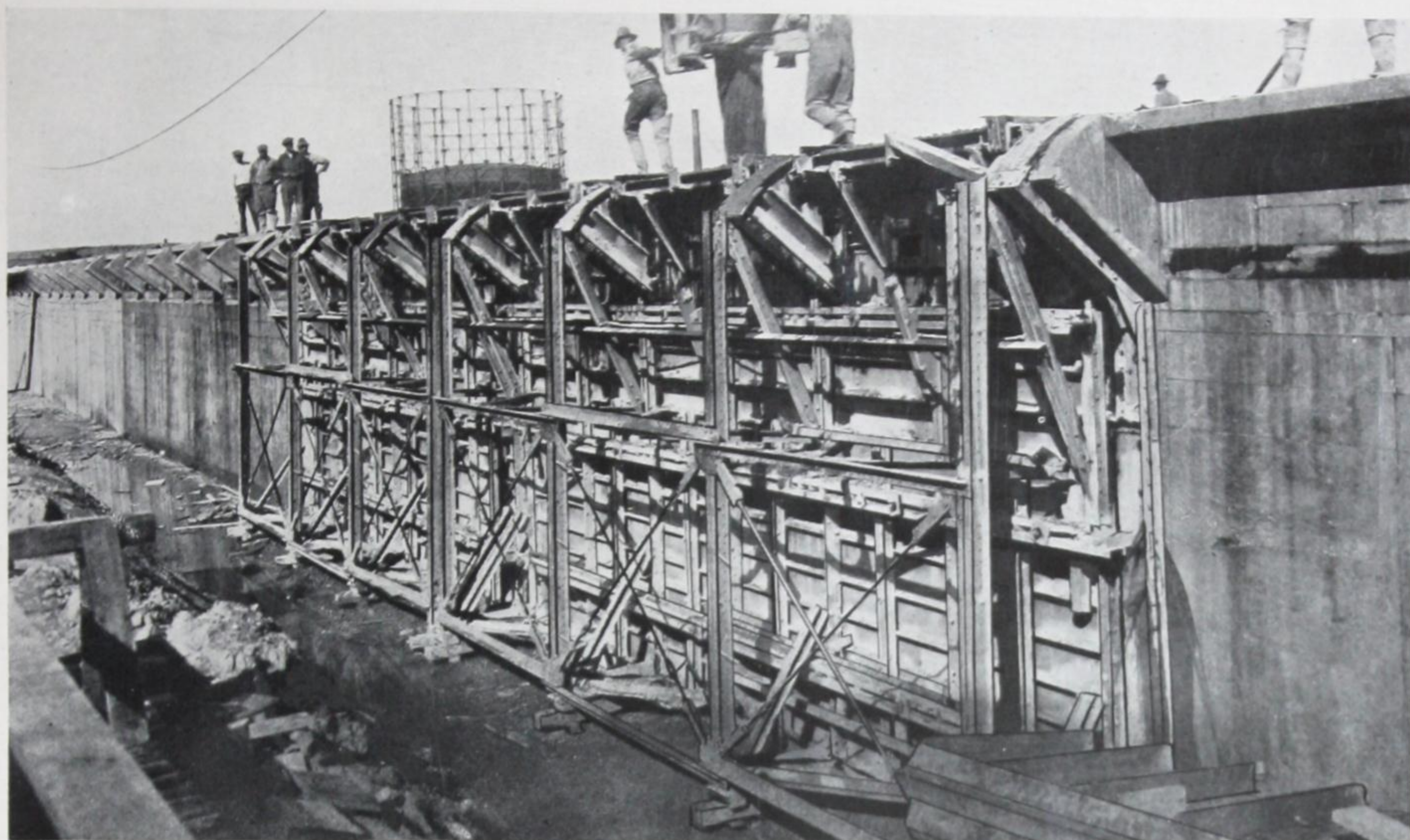


Section of wall, handled by cableway, Chicago Sewage Disposal construction. See page 88 for details.



Completed conduit wall. Blaw-Knox Steel Forms were furnished for rectangular as well as small circular conduits.  
See page 88 for details.



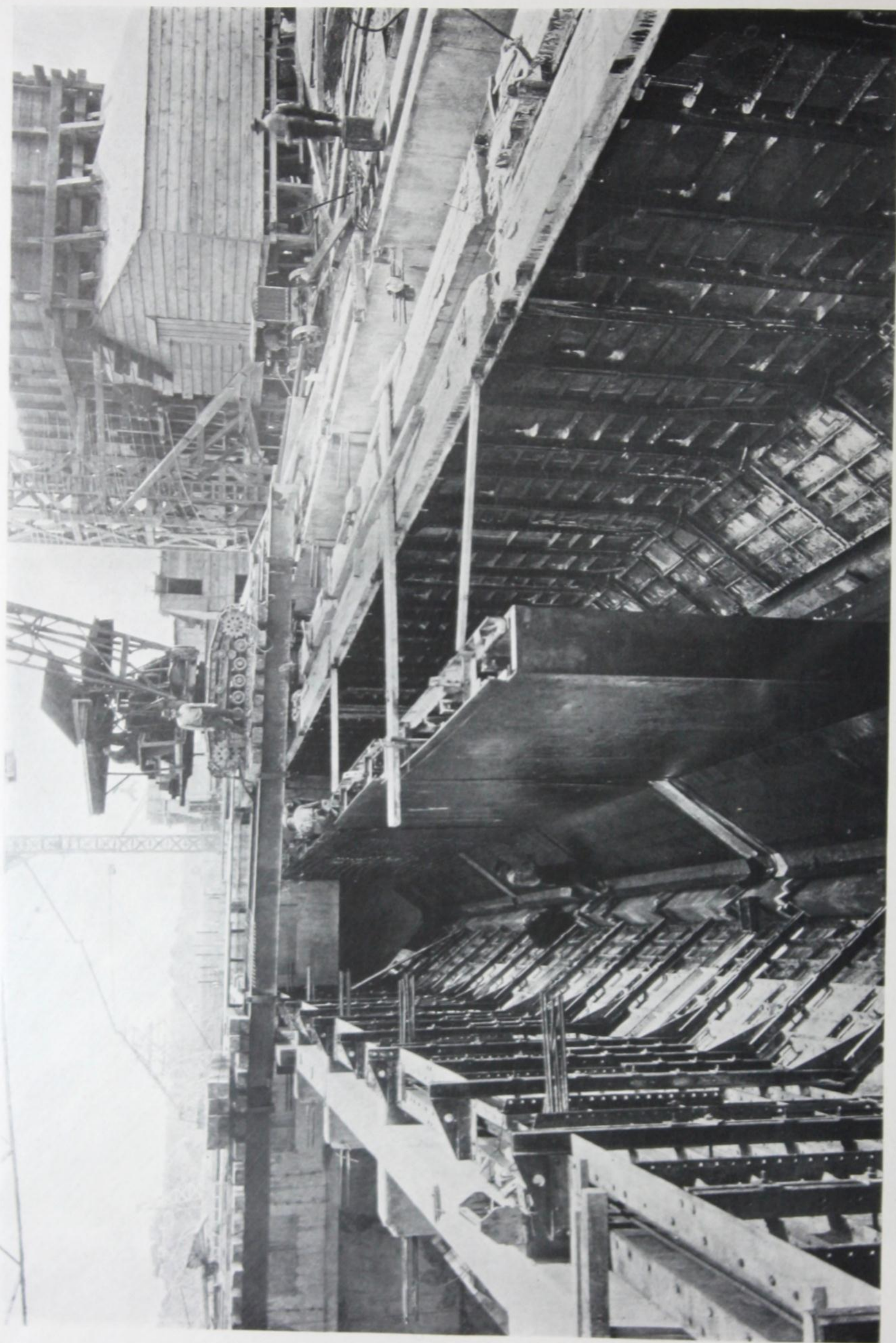


Blaw-Knox Wall Forms used in construction of aeration tank 17' 6" high. Sewage Disposal Plant, Division A, Chicago, Ill. John Griffiths & Sons Company, contractor.



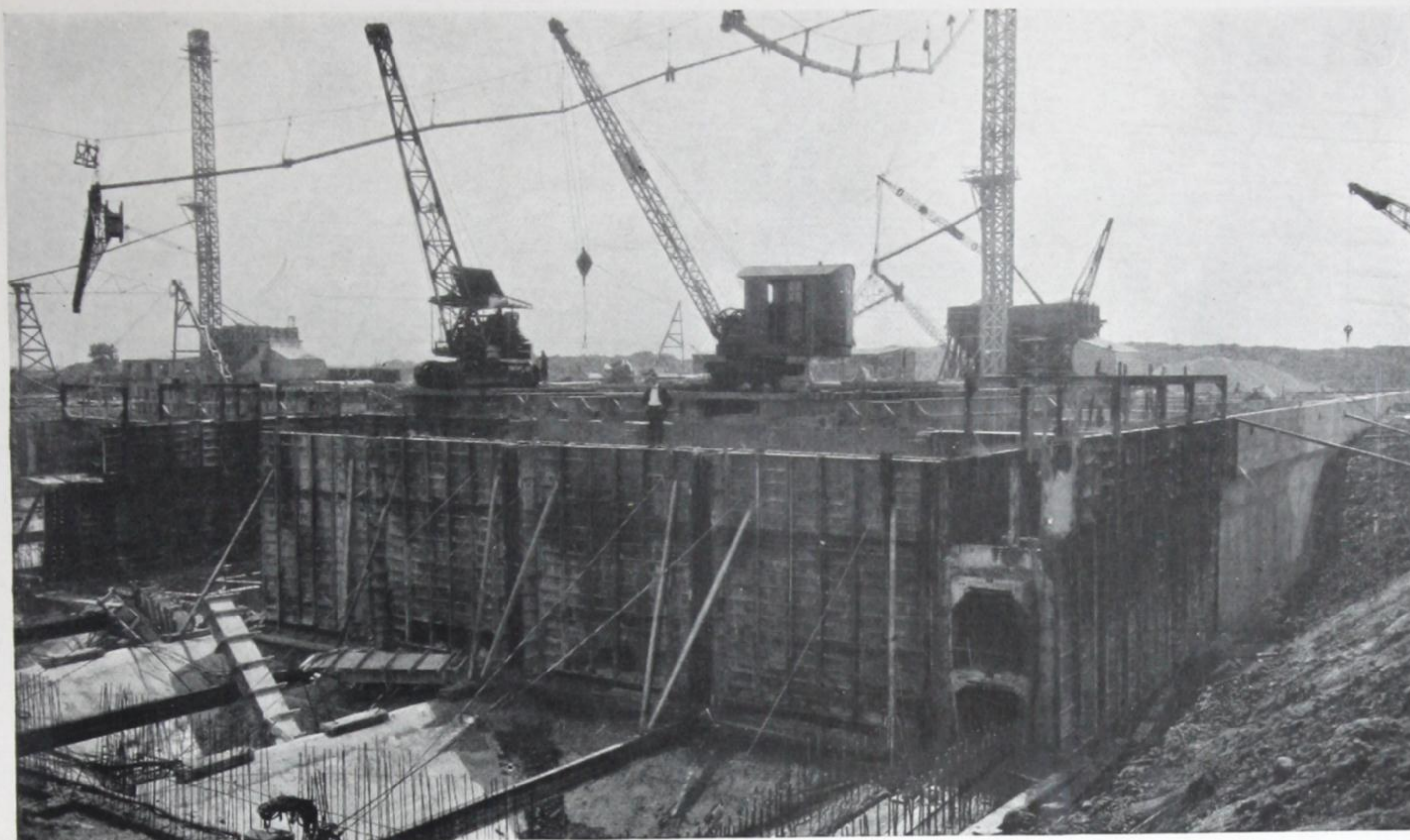
26' units of Blaw-Knox Forms, handled by cableway.



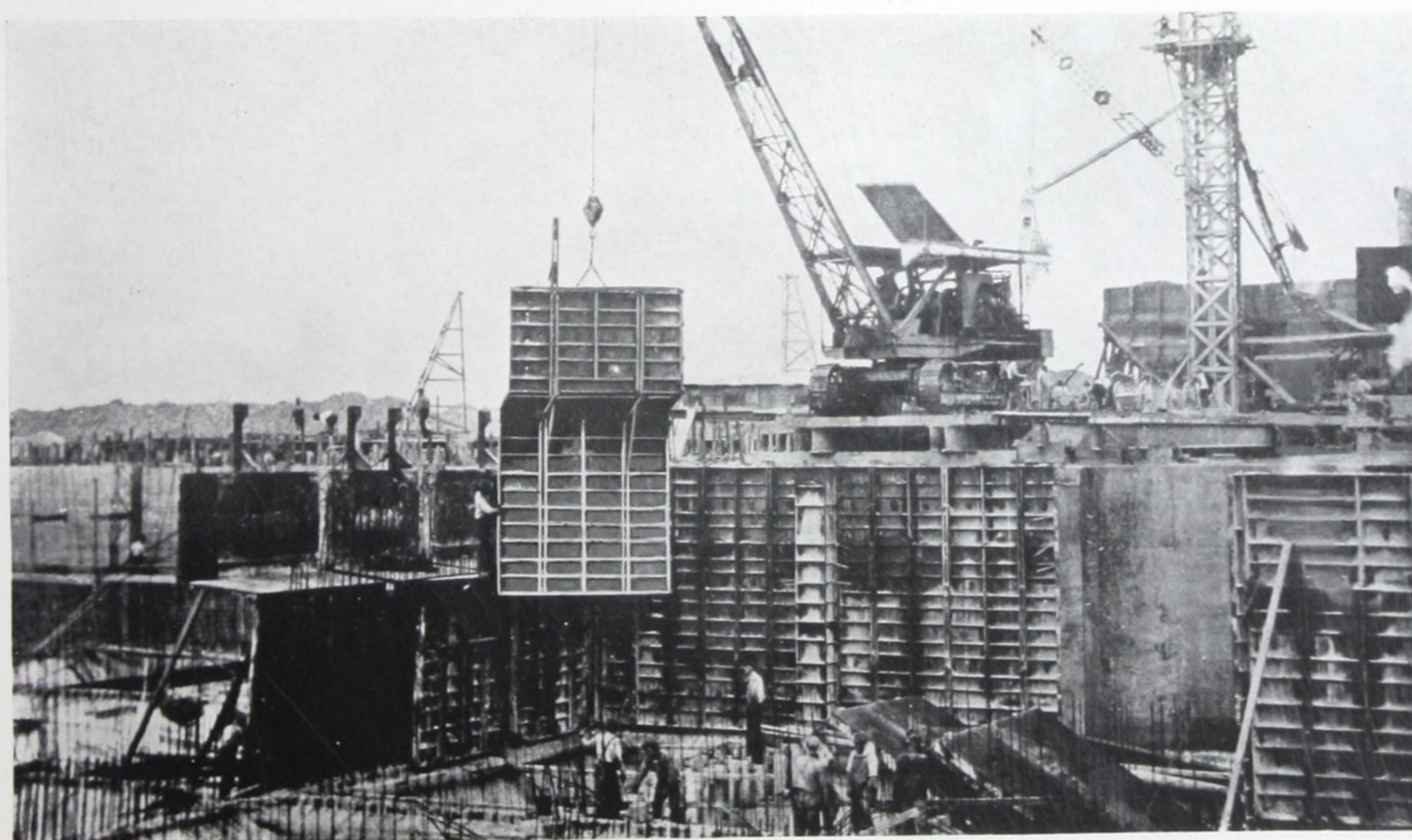


Blaw-Knox Steel Forms used in various wall forming operations in connection with construction of Imhoff Tanks, Calumet Sewage Disposal Plant,  
Chicago, Ill. T. J. Forscher Contracting Company.



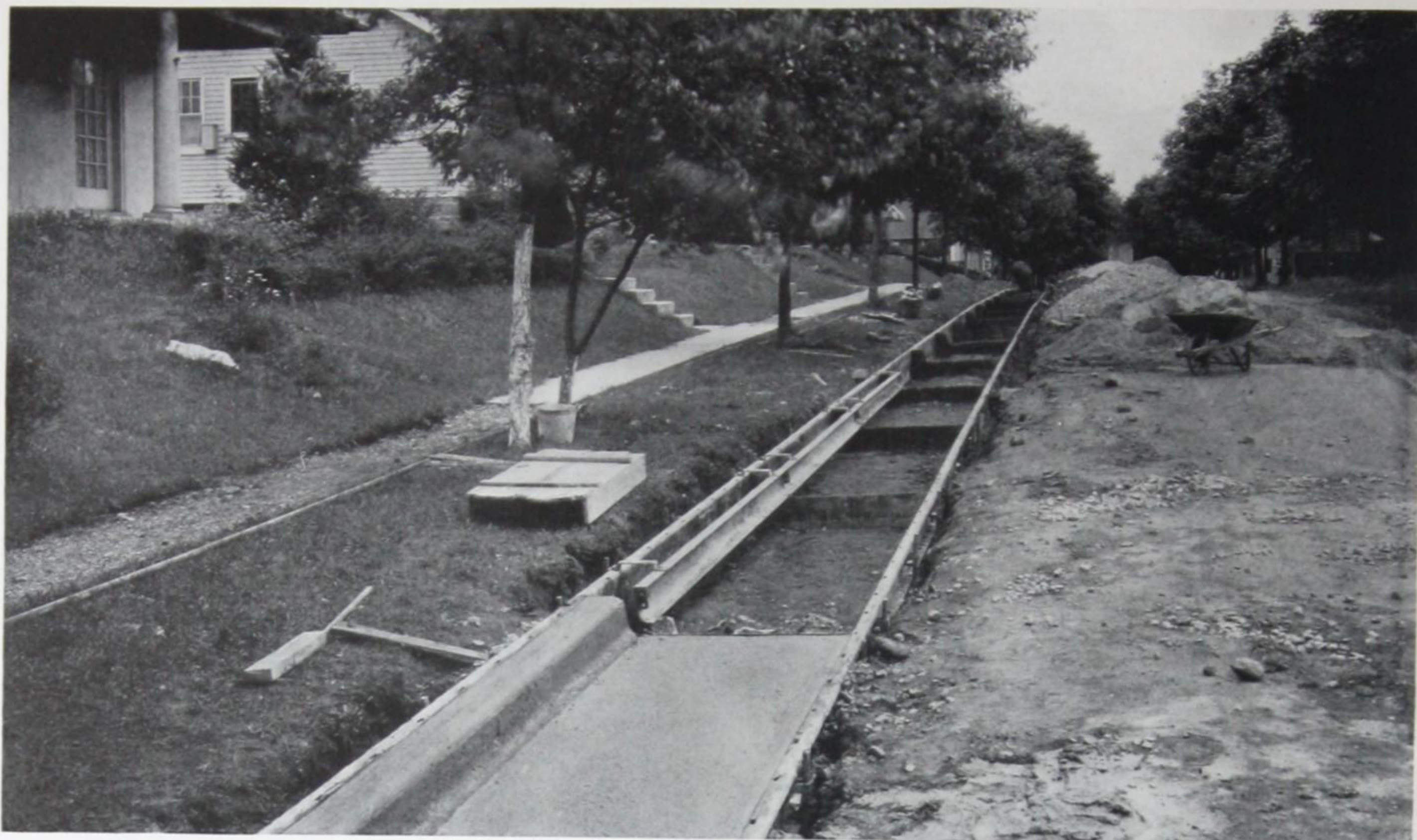


Blaw-Knox steel wall forms used in general construction of Calumet Sewage Disposal Plant. See page 92.

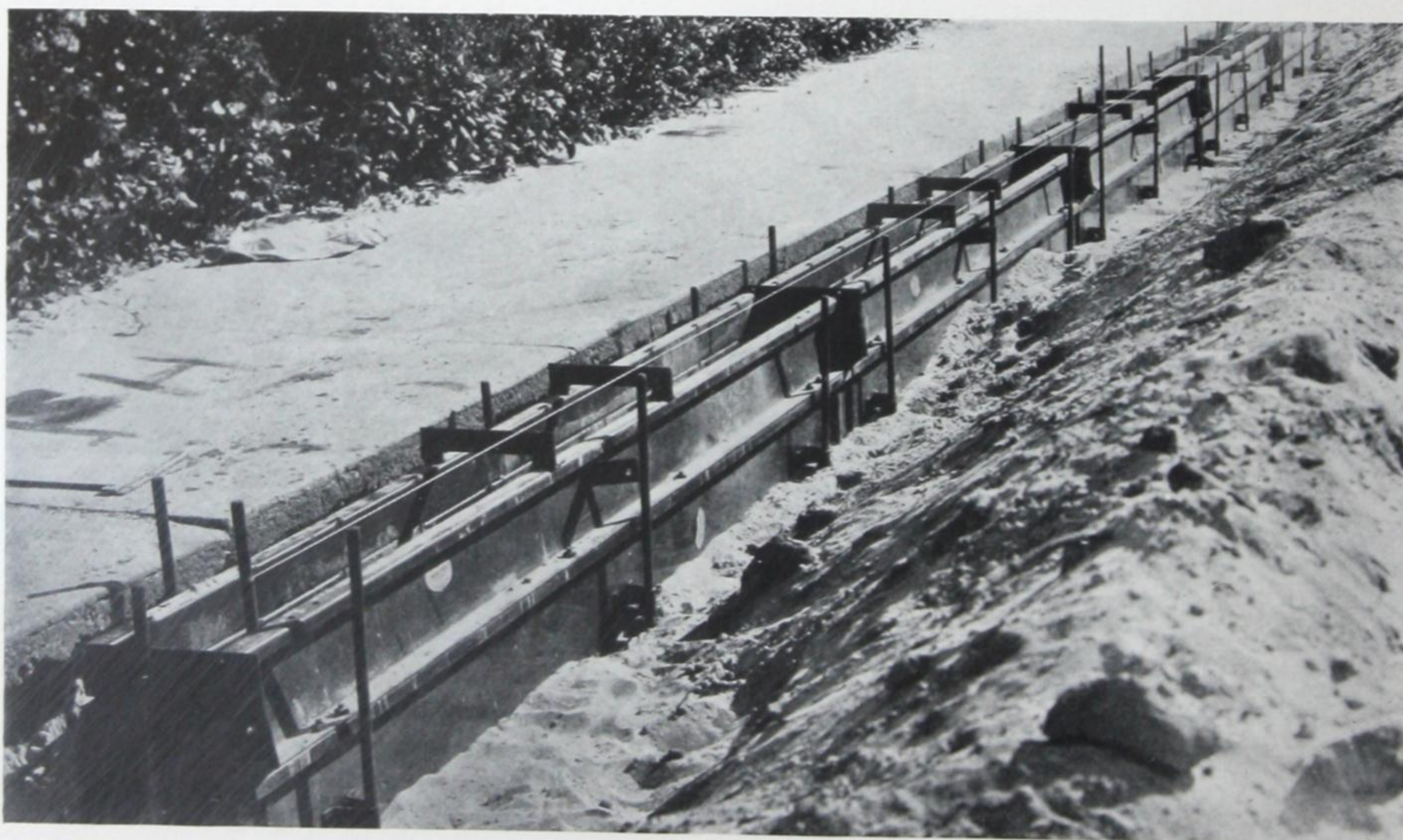


Handling wall panels with crane, same construction.





Blaw-Knox steel forms for combined curb and gutter with steel face form.



Blaw-Knox steel curb form used for straight curb construction with battered face.





## Street, Curb, Gutter and Sidewalk Forms

**B**LAW-KNOX Steel Street Forms are known as Universal forms because they can be used interchangeably on the main types of street work, i.e., sidewalk, curb, combined curb and gutter and integral curb for concrete base construction. When used in combination with steel face forms, wood is entirely eliminated from the forming job, resulting in smooth, dense and durable work.

Compared to wood forms, Blaw-Knox Universal Forms are an economy and convenience. They represent a permanent investment by the contractor, reduce the cost of setting, expedite the work and pay for themselves in a short time.

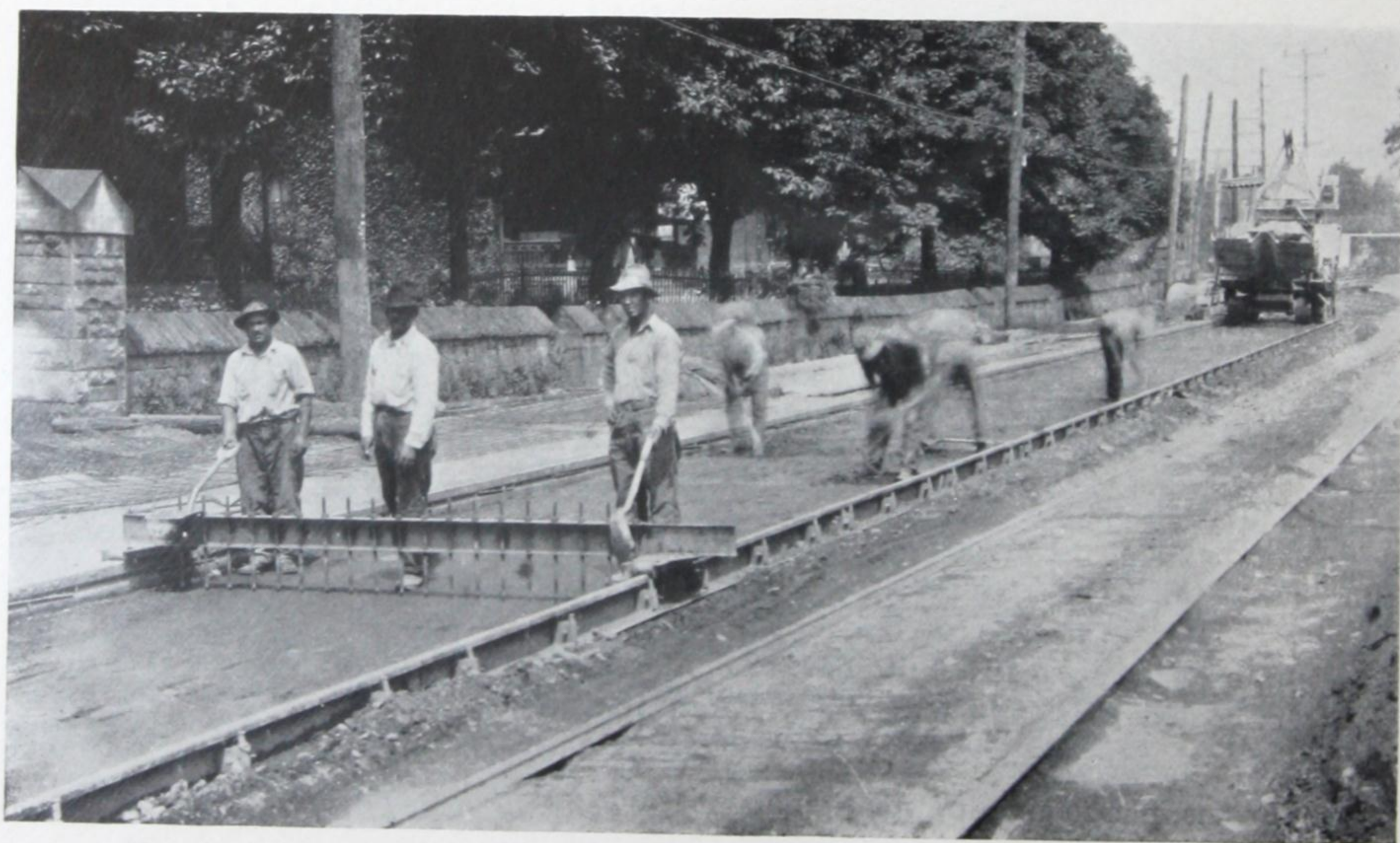
Blaw-Knox Universal Forms and face forms are made to cast any desired shape of cross section. These forms are designed on the unit principle and are built up to the required height and shape by the assembly of the proper units which are self contained. In form setting and dismantling there are only two parts to be handled—the form itself and the stakes.

In inquiring for prices or further information about Blaw-Knox Universal Forms, please give information about the length of the work, the character of the ground, and, if possible, send a blue print or sketch showing the section specified.





Blaw-Knox Dreadnaught Road Forms, easy to set to line and grade.



Blaw-Knox Road Forms building a section of the Lincoln Highway. These forms contribute materially to the construction of smooth roads.



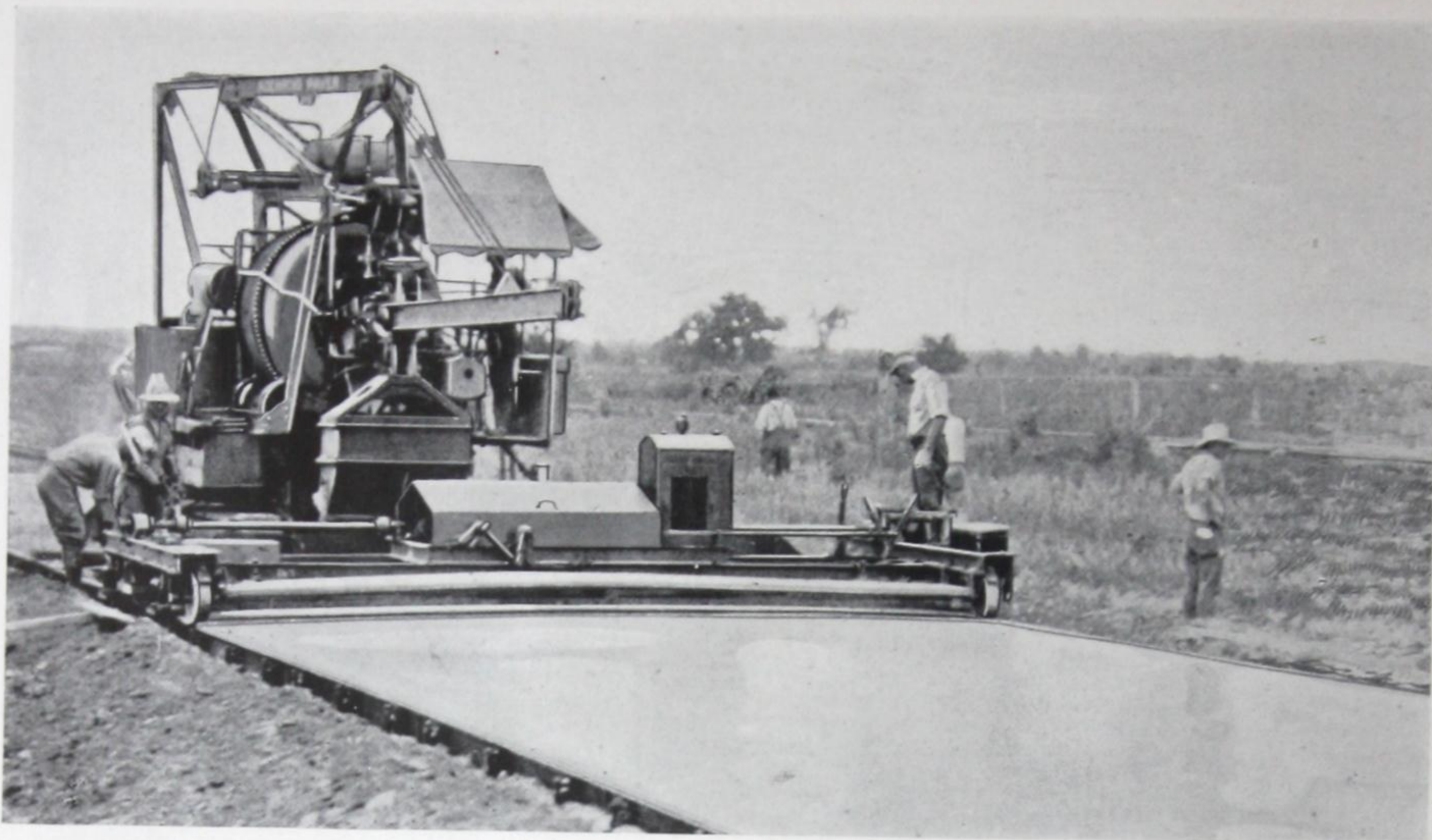


## Road Forms

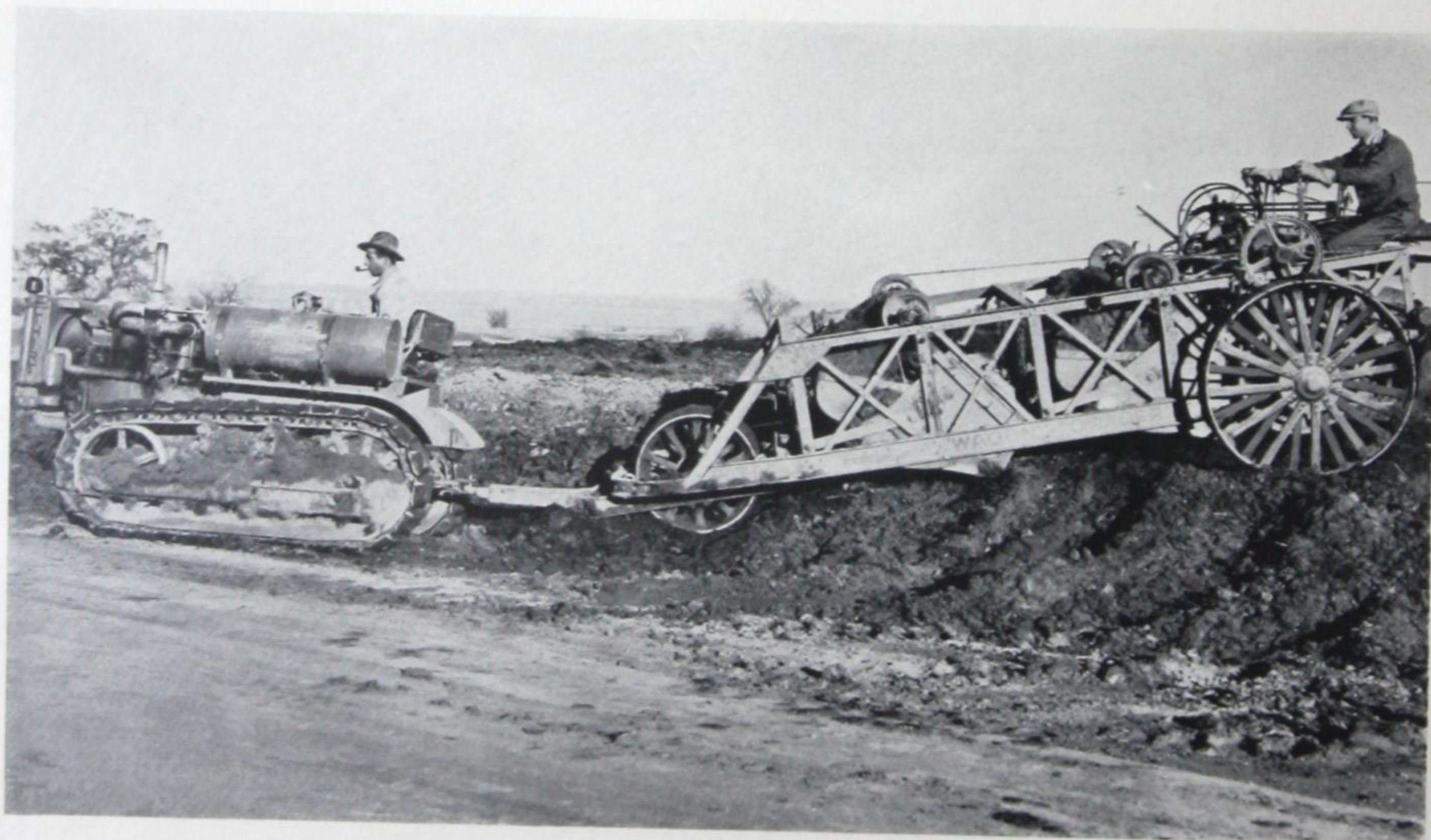
**B**LAW-KNOX Dreadnaught Road Forms have been found essential to the building of the smooth pavement surface which is required to prevent fracture and failure of the slab from the impact of heavy loads. These forms provide a rigid track. They have a positive staking system and are connected together by a patented lock joint which prevents deflection and displacement under the working pressure of the heaviest finishing and subgrading machinery.

Blaw-Knox Forms are easy to set and stay set. They entail only a low handling cost. They are simple in design and exceptionally strong.





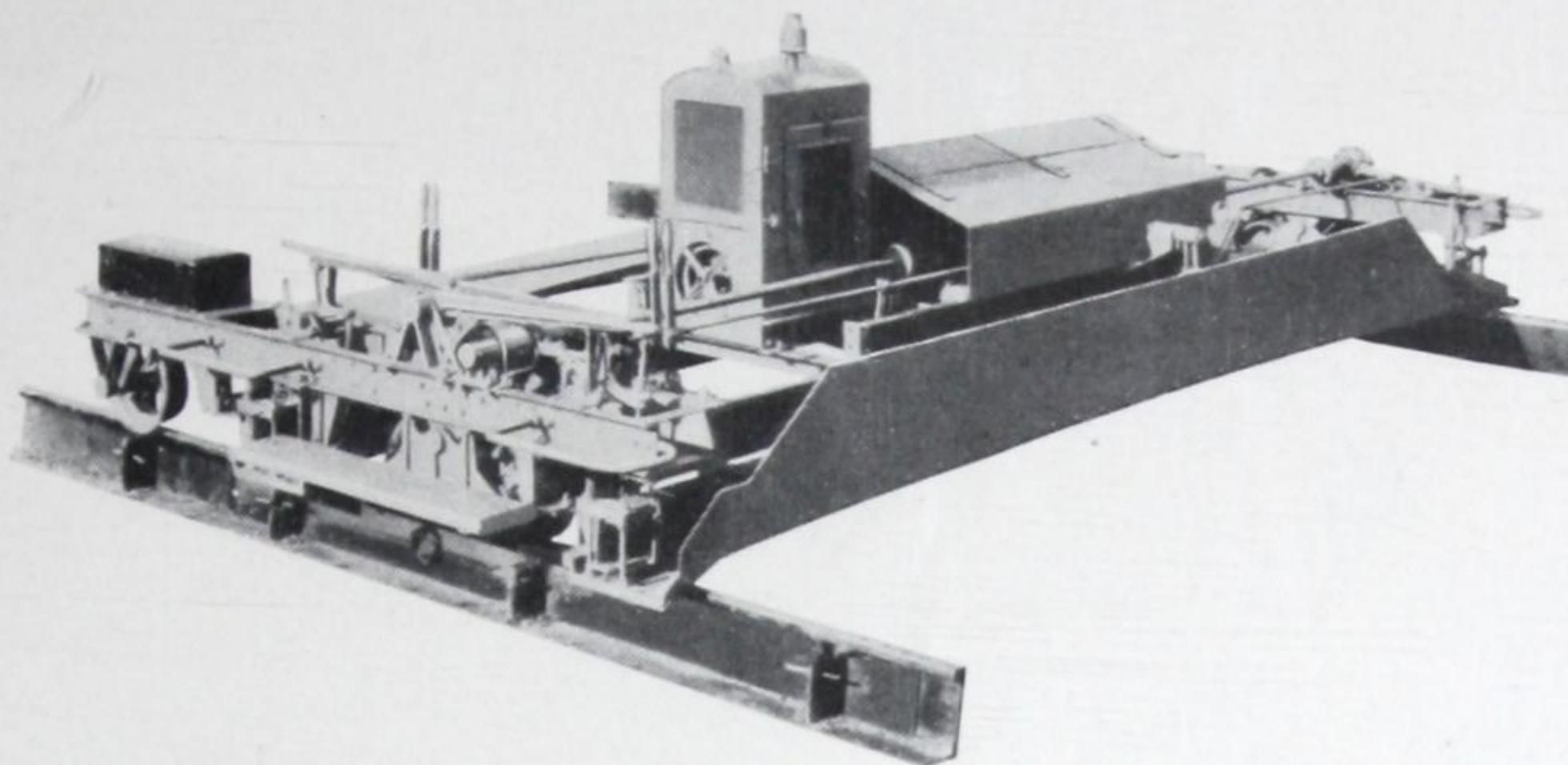
The ORD Finishing Machine on a section of the Lincoln Highway. The ORD Machine is also widely used for finishing asphalt roads.



Ball Wagon Grader in action. It moves dirt at a remarkably low figure per cubic yard.



# Road Finishing Machinery and Graders



The ORD Road Finisher is the original double screed type finishing machine. It is favorably known wherever concrete roads are built. It insures smooth roads, and works in denser concrete.

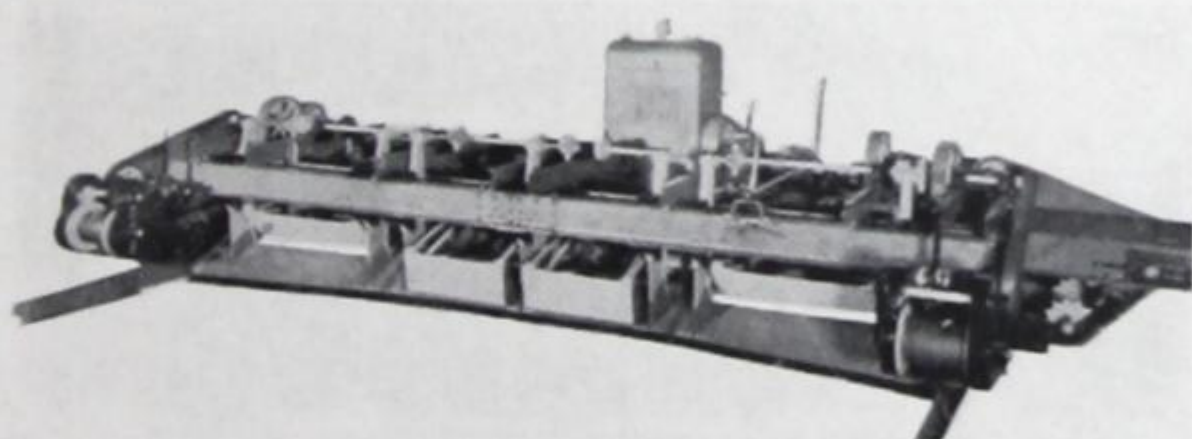
**R**OAD contractors all over the world are unanimously endorsing the Ord Finishing Machine for the quality of its work, its speed, and its economy of operation.

The Nu-Method Finish Grader is without doubt the most efficient machine of its kind ever marketed. It cuts the hardest and

most difficult subgrade at minimum cost.

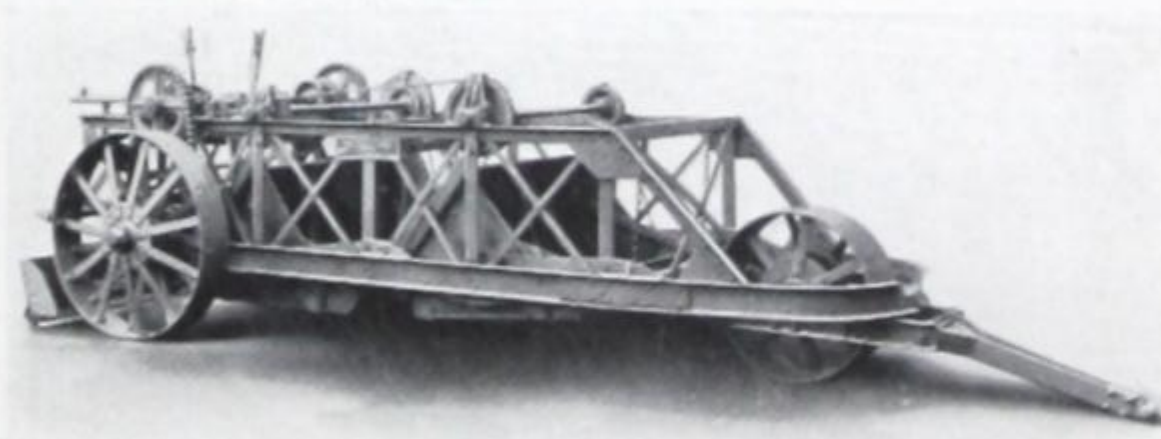
The Ball Wagon Grader is a double bucket unit to speed up movement of dirt or soil from one place to another. It will handle practically every condition of soil.

Illustrated and descriptive literature covering these products will be mailed on request.



**The Nu-Method Finish Grader**

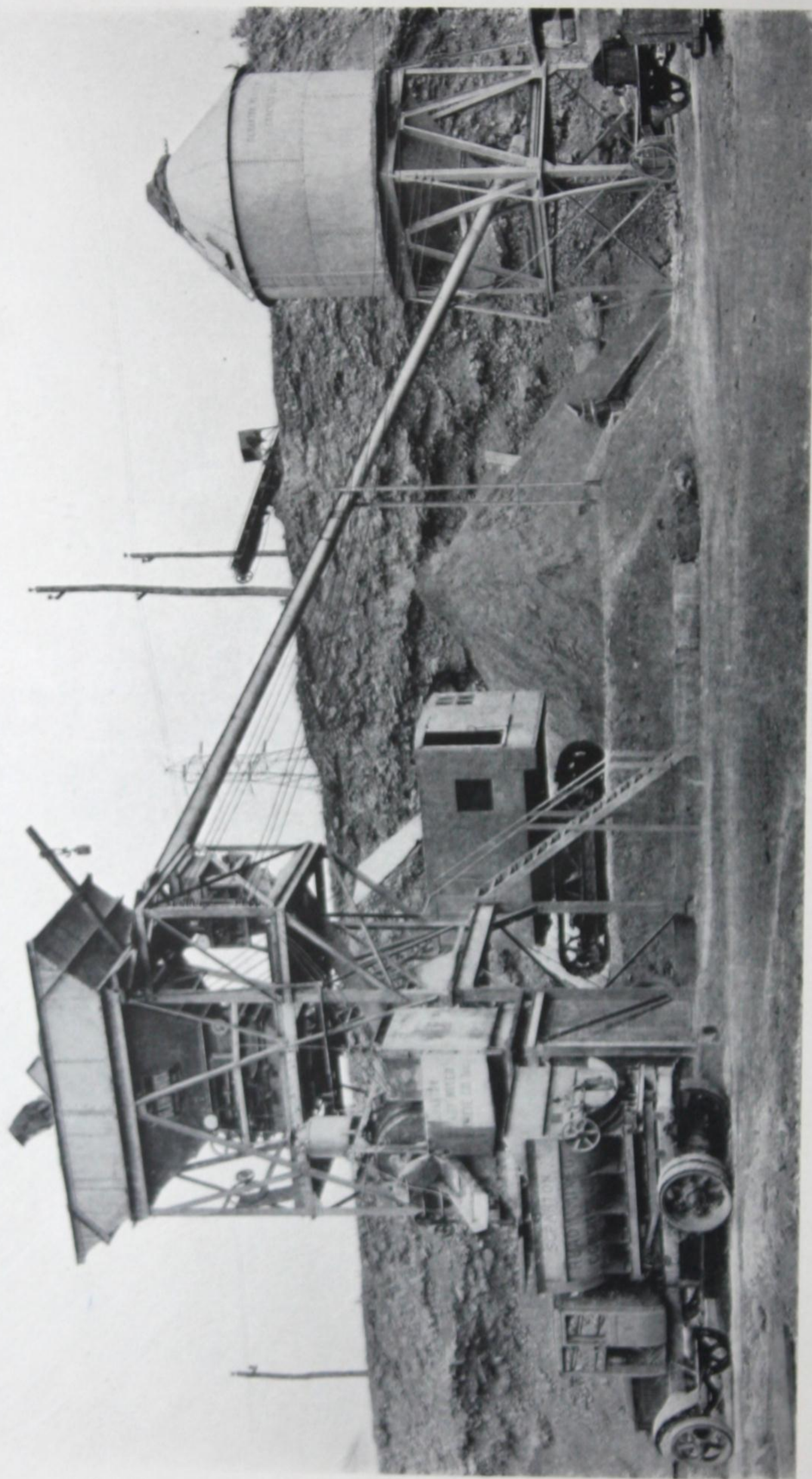
The Nu-Method Finish Grader runs on the forms and cuts the finish or fine grade. It cuts the hardest and most difficult subgrade with minimum cost.



**The Ball Wagon Grader**

The most practical and efficient machine of its kind ever built for dirt moving. Digs, fills and spreads earth accurately, quickly and economically.

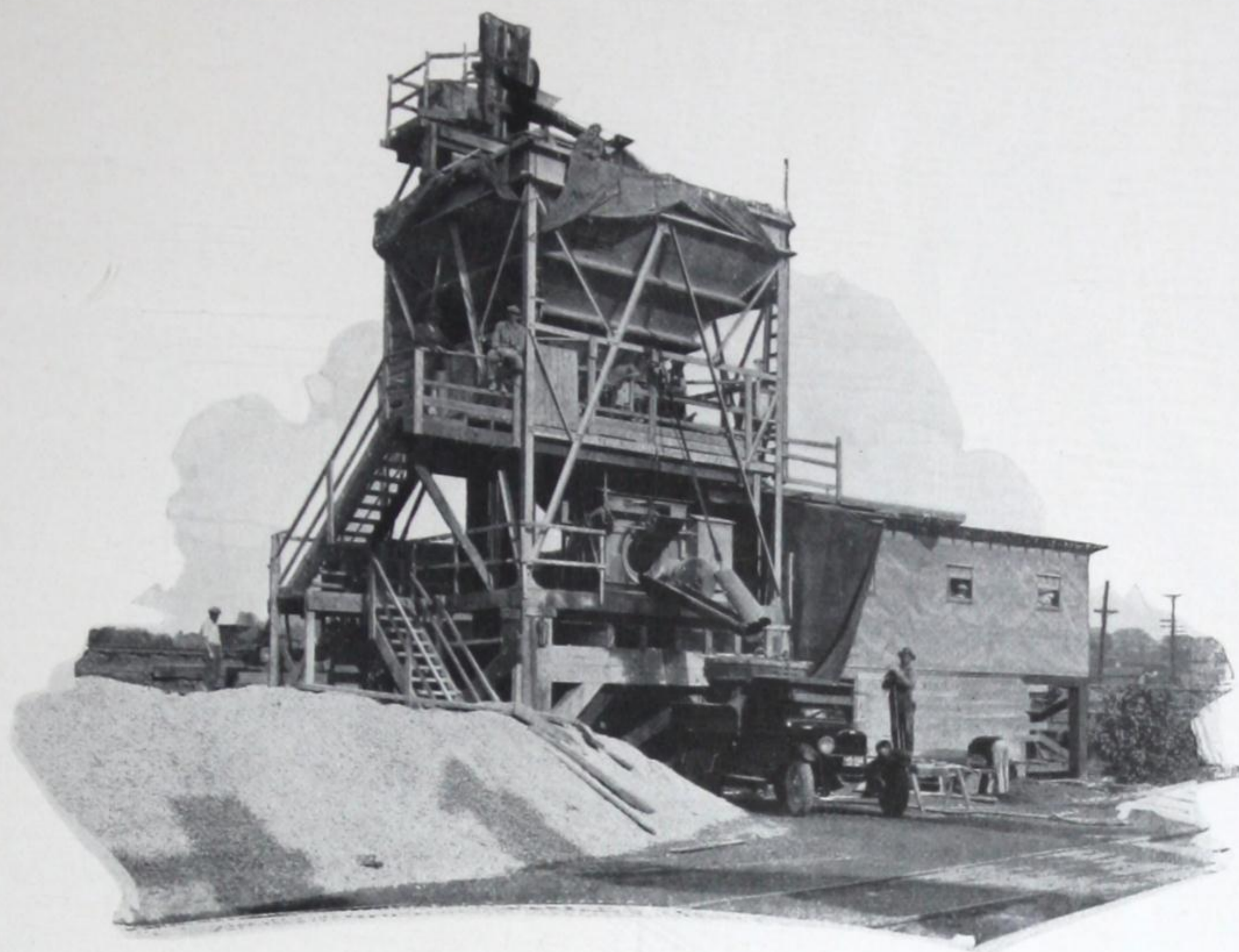




Blaw-Knox central mixing plant equipment installed by the Scranton Ready Mixed Concrete Company, Scranton, Pa. The photograph shows a Blaw-Knox all-steel storage bin equipped with double weighing Batchers and cement weighing Batchers. On the right is shown a Blaw-Knox circular, all-steel, cement storage bin. A screw conveyor is used to charge the cement batcher from the cement bin.

Blaw-Knox Agitator Truck Bodies haul the ready-mixed concrete to the job without segregation.





## Central Mixing Plants

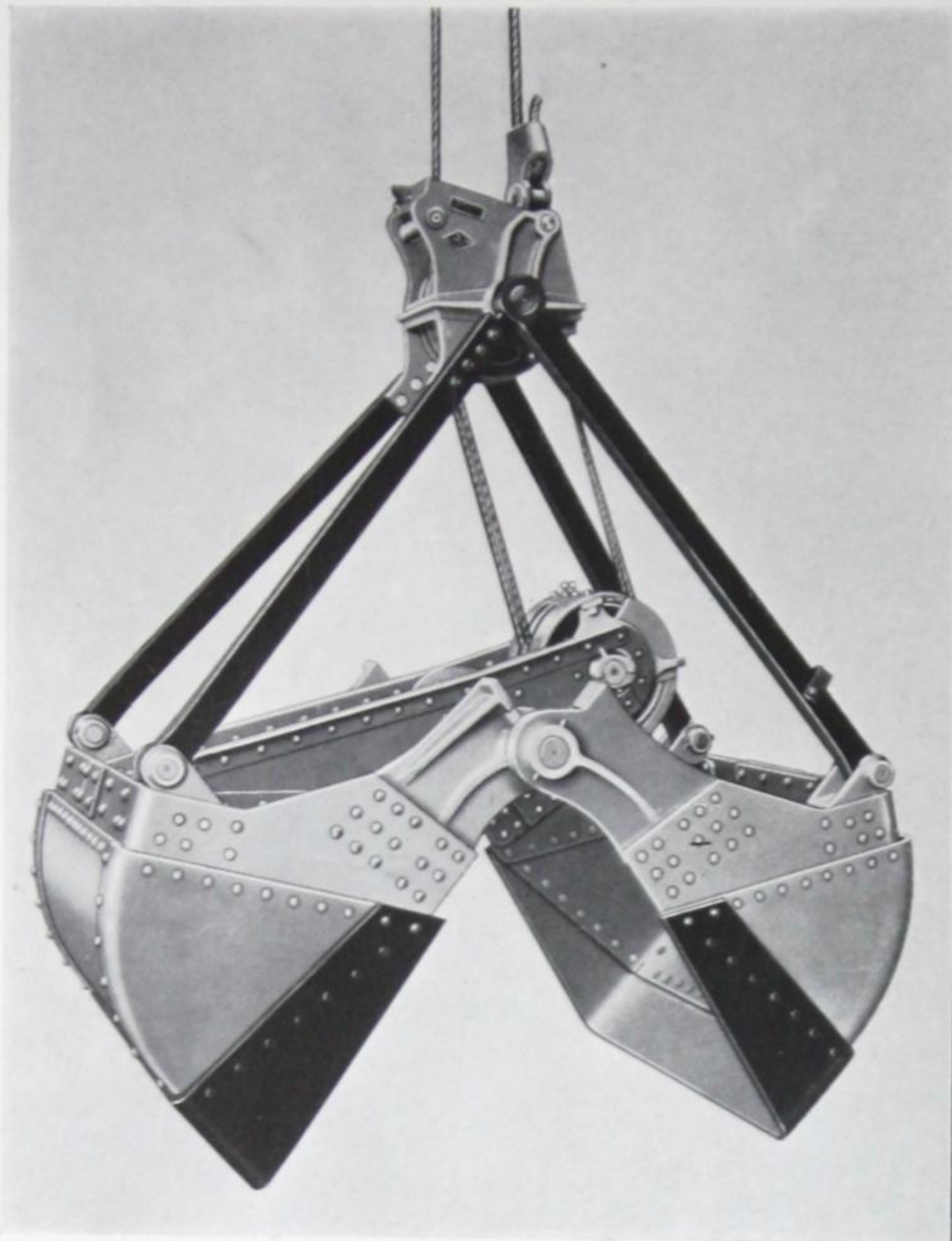
**B**LAW-KNOX Central Mixing and Proportioning Plants (Batcherplants) have since their inception been contributing factors to the production of concrete having a constant unvarying quality. These plants mechanize proportioning, remove the human equation, save time and labor and deliver batches of properly measured aggregates and water to the mixers without variation and with unfailing regularity.

Blaw-Knox Batcherplants for central proportioning and central mixing consist of steel bins for the storage of two or more aggregates, batchers for measurement of sand and stone by weight or volume or the Inundation System for measuring sand in a saturated condition. A typical inundation plant is shown in illustration above, used by Stevens Construction Company, Cleveland, O., on White House Pike, grade crossing elimination. Mechanical improvements provide plants operated by one man, fulfilling all functions of handling aggregates from storage to the mixer.

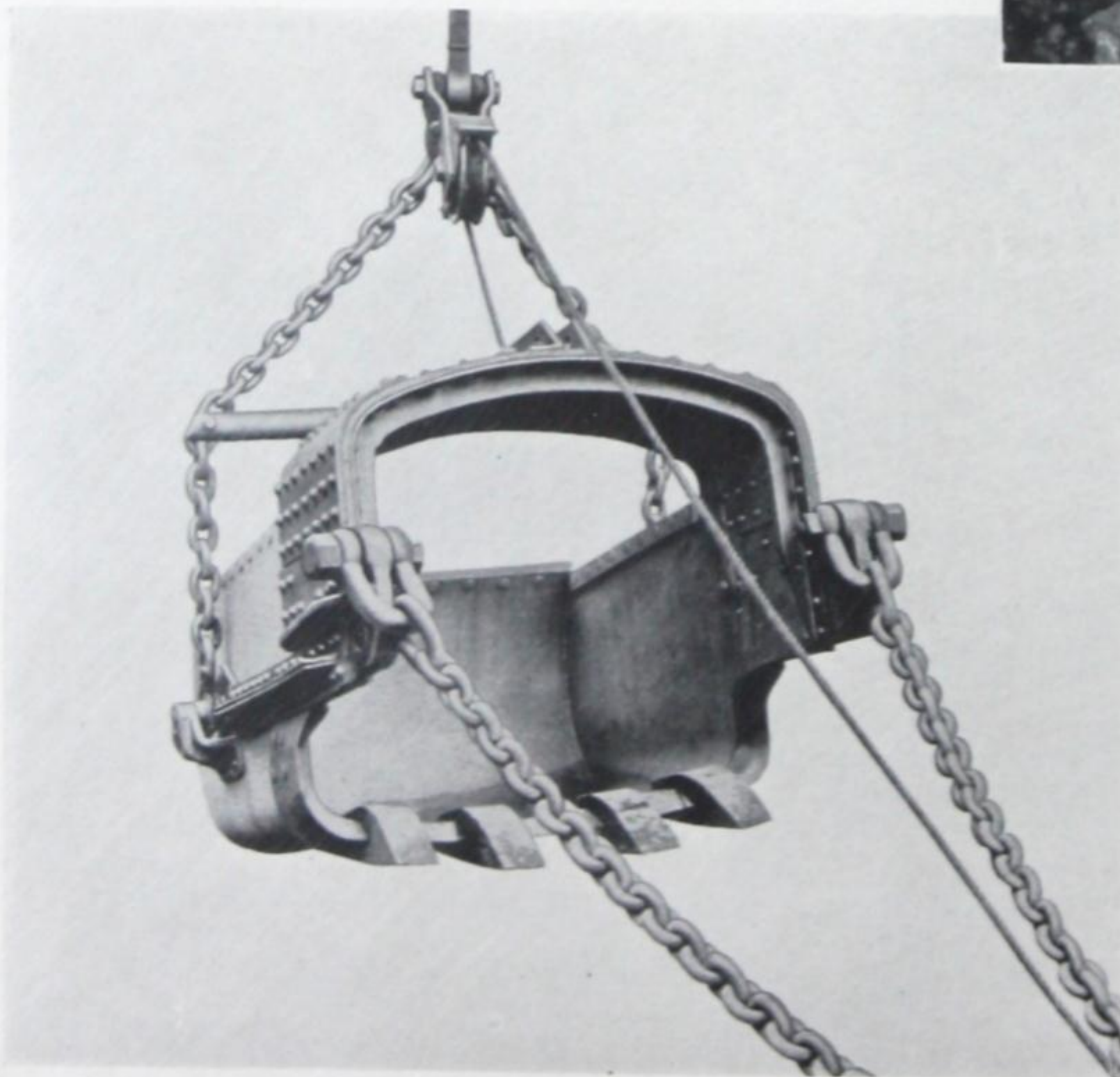
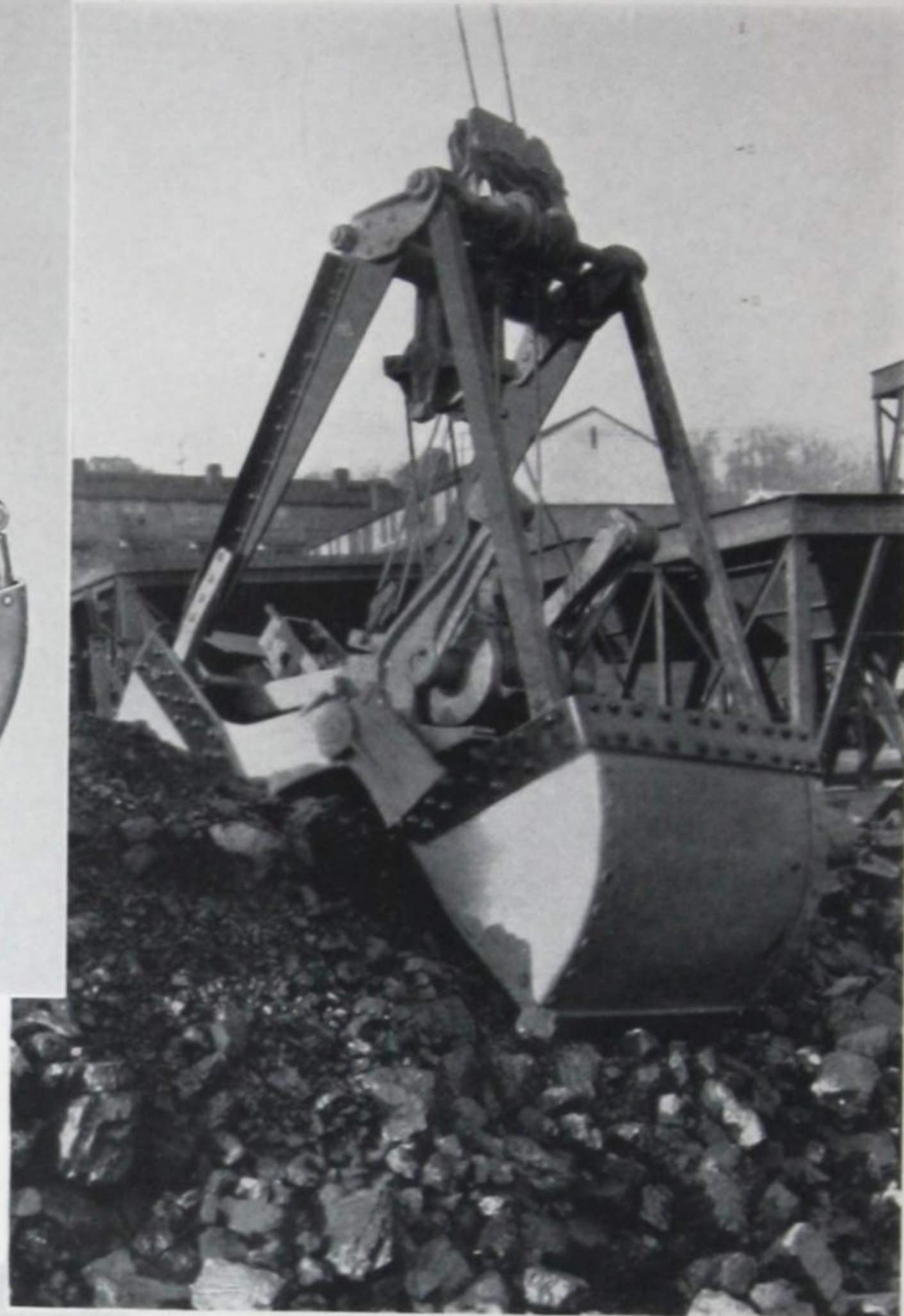
Blaw-Knox Agitator Truck Bodies, as illustrated on page 100, keep the batch constantly in motion, extending the mixing action through the haul. These bodies absolutely prevent segregation and discharge quickly and cleanly. They can be attached to any truck chassis of proper capacity.

Completely descriptive literature covering Blaw-Knox Central Mixing Plants and Agitator Truck Bodies will be sent on request.





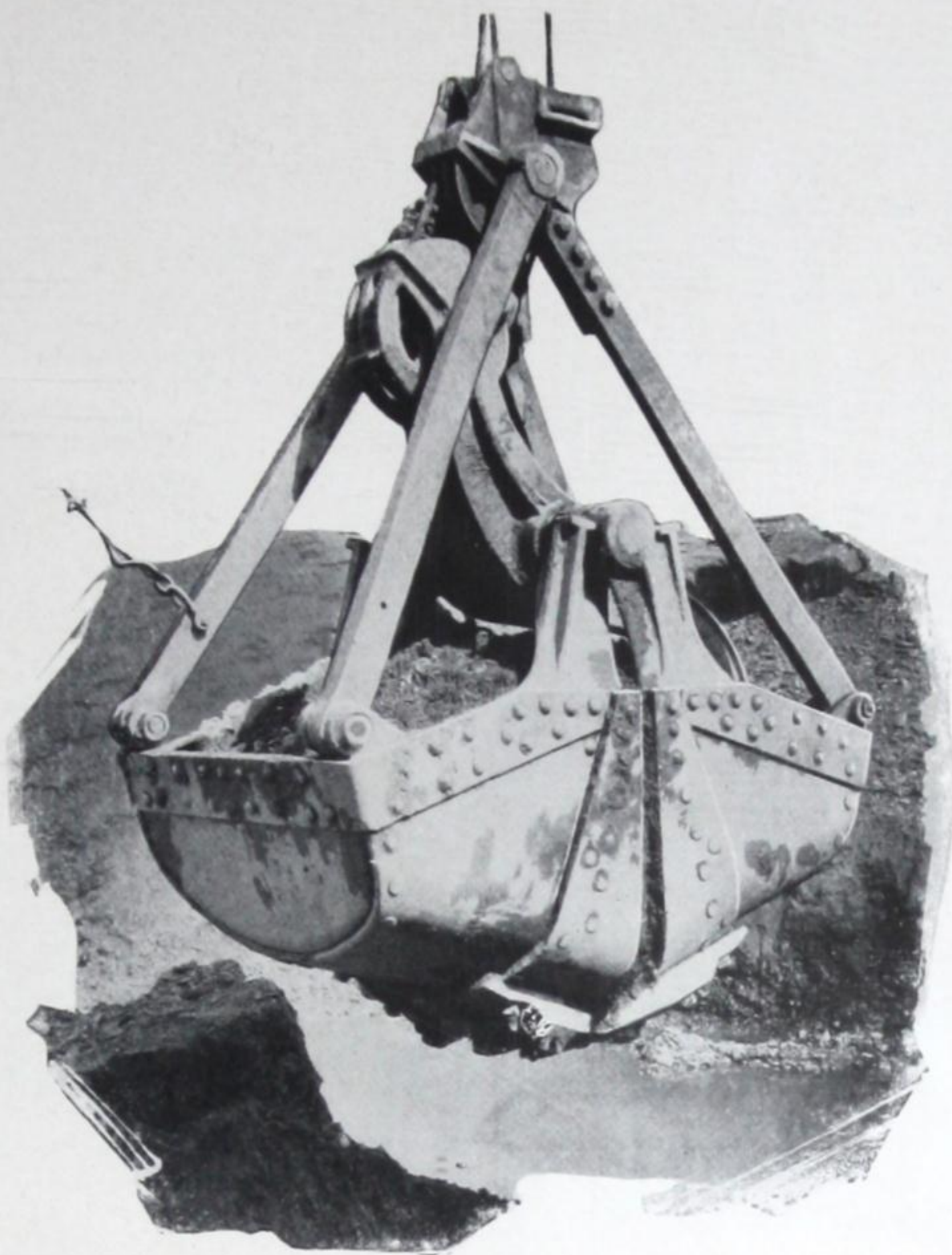
Blaw-Knox Dreadnaught Bucket. Equipped with ball-bearing sheaves. A hard digging bucket. Exceptionally low in maintenance costs.



Blaw-Knox Single Line Bucket for use with single drum hoists. Can be reeved direct or hooked on the crane.

Blaw-Knox Dragline Buckets pull easily, fill quickly and dump clean and fast. These buckets get greater yardage without increasing the gross load on the crane.





## Buckets—Clamshell & Dragline

**B**LAW-KNOX Buckets are built in all sizes and types to the highest possible standards, with one object in view: to insure a greater earning power, a higher yield on the investment than can be expected from ordinary buckets which lack the features and provisions essential to maximum performance and endurance.

Blaw-Knox Dreadnaught Buckets are two line buckets designed for hard digging and fast rehandling. Dreadnaught Buckets are equipped with ball bearing sheaves, a feature which eliminates lost time and expense resulting from sheave bearing trouble. Many types and sizes of Dreadnaught buckets give the purchaser a choice of a bucket to meet his exact requirements.

Blaw-Knox Single Line Buckets are made for operation on single drum hoists. They can be reeved direct or hook-on to the crane. This type of bucket is in much demand where intermittent service is desirable.

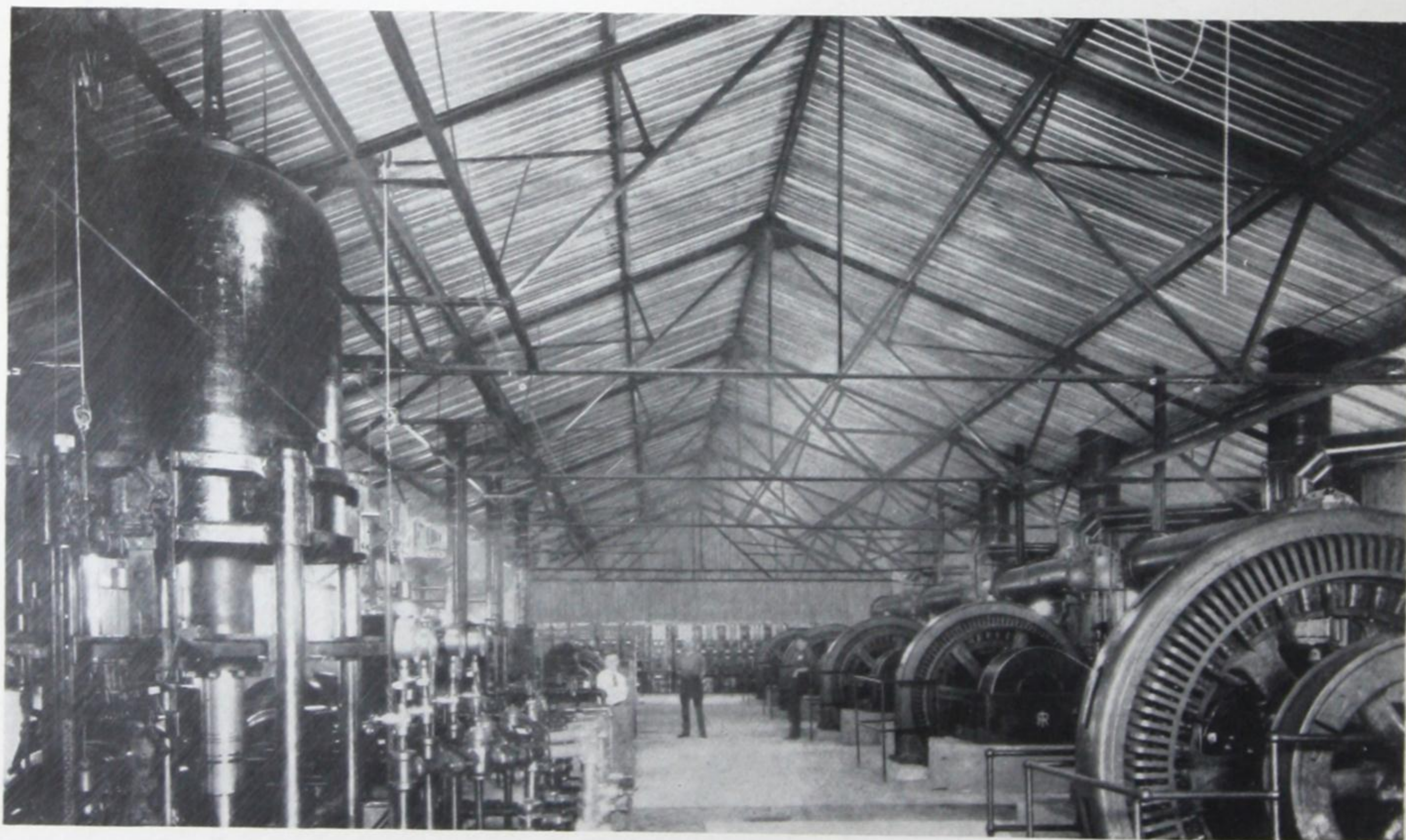
Blaw-Knox Dragline Buckets are made in all popular sizes. They increase crane output, fill quickly and dump clean and fast.

When inquiring for further information or prices on Blaw-Knox Buckets, please mention the nature of the work and the capacity of hoisting rig or crane.





Blaw-Knox Standard Steel Building used to store contractors' machinery. These buildings are weatherproof, firesafe and economical. Can be moved at will and re-erected with low cost.



Blaw-Knox Standard Steel Building used as compressor house by Mason & Hanger Inc., on subway construction in New York City.





## Standard Steel Buildings

**B**LAW-KNOX Standard Steel Buildings have been universally accepted as the most modern type of housing for industry in general. These buildings consist of a predesigned structural steel frame with galvanized, copper-bearing steel cover, providing assurance against corrosion.

Blaw-Knox Buildings are firesafe, weathertight, economical in both first cost and maintenance, permanent, yet easily and cheaply enlarged or changed in shape.

Blaw-Knox Buildings are largely used by contractors for compressor houses, cement and tool storage, field offices and miscellaneous uses about the job. Many Blaw-Knox Buildings have served their time on a construction project and been later sold for other uses with very little difference between first cost and resale price.





## Export Shipments

**T**HE Blaw-Knox Company has shipped steel forms to practically every country in the world. This experience has taught us how to design, manufacture, pack, mark and ship every order in such a manner that the shipment arrives at its destination in proper condition with the lowest possible freight and handling costs. Special erection drawings and directions for use are made a part of every export shipment.



*If the experiences of other contractors are of interest to you, the evidence on this and the following pages will be well worth your reading*

SIEMS, HELMERS & SCHAFFNER  
INCORPORATED  
CONTRACTORS  
1014 GUARDIAN LIFE BUILDING  
ST. PAUL, MINN.

September 12, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.  
Gentlemen:

About the first of this year we purchased from your Company approximately 210 feet of telescopic tunnel forms for the concrete lining of the Wy-noochee tunnel (three miles in length) for the City of Aberdeen, Wash., which work is being handled by Siems & Carlson.

It may interest you to know that these forms have worked perfectly and we have experienced no trouble at all in handling them. In fact, we have been able to get the maximum footage of lining per day since commencing work. This is rather unusual as the tunnel is only 8 feet in diameter, and necessarily the units are quite compact. We do not see how we could have improved in any way on the tunnel forms.

We have mailed you photographs showing these tunnel forms in place in the tunnel, and it looks at the present time as though we would be able to finish our contract ahead of our original schedule.

Yours very truly,  
SIEMS, HELMERS & SCHAFFNER, INC.

*H. A. Schaffner*

*James O. Heyworth, Inc.*  
*Builders*  
*Harvester Building*  
*Chicago*  
*Attention*

March 22nd, 1928

Blaw-Knox Company,  
Pittsburgh,  
Pennsylvania.

Attention Mr. Chester H. Lehman, General Sales  
Manager

Dear Sir:

As you know, our organization used Blaw-Knox steel forms for the construction of the 4500-foot reinforced concrete bridge known as the North Hill Viaduct at Akron, Ohio, and for the 1800-foot reinforced concrete Intercity Bridge between the Cities of Minneapolis and St. Paul. These forms gave complete satisfaction both as to the material itself and the service rendered by your Company in connection with the use of same. Should we ever be in a position where these forms can be used to advantage, that would be the way in which we would, no doubt, bid and construct the project.

Very truly yours,  
JAMES O. HEYWORTH, INC.

*J. O. Heyworth*

Secretary-Treasurer

*C. A. Handeyside Construction Company*  
Contractors and Engineers

12-233 General Motors Building  
DETROIT, MICH.  
Empire 7330

March 20, 1928

Blaw-Knox Company  
Pittsburgh, Pa.

Attention: Mr. Chester H. Lehman,  
General Sales Manager.

Gentlemen:

We have your letter of March 14, in which you ask us for an expression regarding the use of Blaw-Knox Steel Forms.

You perhaps know that we have used your forms on sewer construction only as we do not get into other types of construction where forms of this nature are used.

On sewer work it has been our experience that where we have had a given number of feet of your steel forms we have been able in every instance to maintain a definite schedule of progress, and we have found that the steady uniform progress on sewer construction work is the thing that counts most of all.

Yours very truly,  
C. A. HANDEYSIDE CONSTRUCTION CO.

*C. A. Handeyside*

HEDGES-WEEKS CONSTRUCTION COMPANY  
ROOMS 415-416 HOLLAND BUILDING  
RAILROAD MASONRY CONTRACTORS  
SPRINGFIELD, MISSOURI



SKILL, INTEGRITY AND  
RESPONSIBILITY

March 28, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.

Gentlemen:

We wish to go on record as a booster of Blaw-Knox Steel Forms.

The two sections furnished us for placing the concrete lining in Tunnel No. 1 on the Illinois Central Railroad Company's cut-off have worked to our entire satisfaction.

We have used them successfully in pouring fifty-four sections of tunnel, aggregating approximately 5,200 cubic yards of concrete.

Yours truly,  
HEDGES-WEEKS CONSTRUCTION CO.

*L. A. Weeks*



THE PITT CONSTRUCTION COMPANY  
INCORPORATED  
ENGINEERS AND CONTRACTORS  
EMPIRE BUILDING  
PITTSBURGH, PA.

March 19th, 1928

Blaw-Knox Company,  
Pittsburgh, Penna.

Att: Mr. Chester H. Lehman.

Dear Sir:

An analysis of our costs of the work on which we have used your steel forms shows that with a reasonable number of re-uses, approximately twenty, that there is a saving in the form cost over that obtained when wood is used. Of course, where more re-uses are obtained a greater saving is effected.

We find in the construction of concrete arches that a saving can be obtained under average conditions where there are four or five re-uses of the centers. This number of re-uses, of course, is not a hard and fast rule, but may either increase or decrease due to the type of the structure, and the obstacles spanned by the bridge.

In addition to the economies outlined above we note an additional saving in the total labor required on the job where steel forms are used. This is doubtless due to the fact that with this type of form, we are enabled to work out a definite program which can be followed day in and day out requiring the same number of men at all times.

Yours very truly,

THE PITT CONSTRUCTION COMPANY, INC.

*E. H. H. H. H.*

*Booth & Flinn, Limited,*  
*Contractors.*

NEW YORK, N. Y.

December 2nd, 1927

Blaw-Knox Company,  
Pittsburgh, Pa.

Attention of Mr. Howard B. Loxterman,  
Asst. General Sales Manager.

Gentlemen:

In concreting the HOLLAND Vehicular Tunnels in New York, it was essential that we combine speed of construction with quality of surface, and that the variety of operations be so co-ordinated that they would not tend to decrease production.

For this reason, it was decided to use Blaw forms, and, with the aid of your Engineers, we obtained a form that entirely met our requirements.

Very truly yours,

BOOTH & FLINN, LIMITED

*M. R. Chamberlain*  
Chief Engineer

WOODS BROTHERS CONSTRUCTION CO.  
ENGINEERS AND CONTRACTORS  
LINCOLN, NEBRASKA

December 22nd, 1927

Blaw-Knox Company,  
Peoples Gas Bldg.,  
Chicago, Illinois.

Attention Mr. J. C. McQuide.

Dear Mr. McQuide:

Before beginning the construction of the Starved Rock Lock and Dam, it was decided by our officers we would give the Illinois Waterways Commission the best concrete job within the State. This applied to both workmanship and appearance.

To determine whether to use steel, or wooden forms, we had to consider two main points. First, the appearance of the work after it was completed, and second, the ability to pour continuously the day's run of concrete into a form, without danger of springing the form out of line.

We have now completed all of the work for which your forms were to be used and find they did not spring out of line and the face of each block is smooth and symmetrical, joining up with its companion blocks in a perfect way.

We are entirely satisfied with the performance of the forms and you with Mr. Brynoldt are to be commended for the interest you have taken in making these forms as workable as we found them.

Yours very truly,

WOODS BROS. CONSTRUCTION CO.

*Raymond P. Hingle*  
Chief Engineer

T. A. GILLESPIE COMPANY  
ENGINEERS AND CONTRACTORS

SEVEN DEY STREET

NEW YORK

April 10, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.

Gentlemen:

Answering your inquiry as to our opinion of Blaw-Knox Forms, I am glad to say that we have used them very successfully for over twenty years; in fact, I think we were the first contractors to employ them, they having been used in the construction of the Pittsburgh Filtration Plant in 1906. Our opinion is they are the most economical type of forms made and we congratulate you upon the well deserved success which you have made in their design and manufacture.

Yours very truly,

T. A. GILLESPIE COMPANY

*John J. Gillespie*  
President



**OAKDALE CONTRACTING COMPANY, INC.**  
ENGINEERS & GENERAL CONTRACTORS  
127 WAVERLY PLACE  
NEW YORK

April 4, 1928

Blaw-Knox Company,  
Pittsburgh,  
Pa.

Att: Mr. Chester H. Lehman

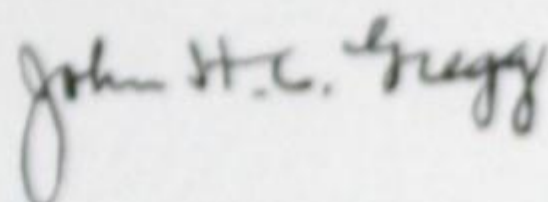
Gentlemen:

In reply to your letter of March 14 advising us of your new catalogue on Blaw Steel forms and requesting a comment on our experience with your product, we are very glad to say that your forms have proven most satisfactory. As you know, we have used your forms for the past five years on our subway contracts and believe them the best on the market.

It may likewise interest you to know that the writer, in twenty years' experience on aqueduct, tunnel and subway construction has seen Blaw forms used with great success on each job and knows that they proved a big factor in carrying these contracts to successful completion.

Very truly yours,

OAKDALE CONTRACTING COMPANY, INC.



Chief Engineer

**ROSOFF SUBWAY CONSTRUCTION CO., INC.**  
461 EIGHTH AVENUE  
NEW YORK

March 21st, 1928

Mr. Chester H. Lehman,  
General Sales Manager,  
Blaw-Knox Company,  
Pittsburgh, Penna.

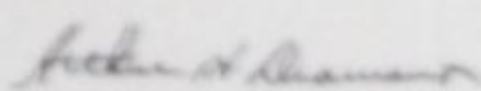
Dear Sir:—

The delay in answering your letter of March 14th was due to much urgent business and the writer takes this his first opportunity to tell you what he thinks of Blaw-Knox Forms.

As a part of the equipment of any subway construction, particularly that in New York City, the Blaw-Knox Forms are invaluable. You yourselves realize, of course, that steel forms cannot be used in every phase of the construction, but wherever they are applicable we have made it a point of using them. With the mechanical devices for operating steel forms, labor cost is considerably reduced, and we take pleasure in recommending them to any contractor who is desirous of cutting his concrete costs.

Very truly yours,

ROSOFF SUBWAY CONSTRUCTION CO. INC.



Vice President

**HEYMAN & GOODMAN COMPANY**  
ENGINEERS AND CONTRACTORS  
303 SOUTH BROAD ST.  
PHILADELPHIA, PA.

March 22nd, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.

Attention: Mr. Chester H. Lehman.

Gentlemen:

Regarding Blaw-Knox Forms used by us during the last seven years, we find that the use of Steel Forms equipped with proper handling devices and carriages for moving, results in organizing the concrete work so that it will proceed in orderly sequence.

The erection, the striking of the forms, the moving forward, and the re-erection has to be done in an orderly manner. All of these operations were done by us in a very rapid manner, resulting in consistent progress. Where a considerable re-use of the form is possible, great economy results over the use of wood forms.

Essentially your steel forms, which are designed by the Blaw-Knox Company to fit the job, required you to study out the entire problem in advance and the usual result is a form made satisfactory for doing the work in a rapid manner.

Very truly yours,

HEYMAN & GOODMAN COMPANY



Chief Engineer

**THE WHITING-TURNER CONSTRUCTION COMPANY**  
[INCORPORATED]  
ENGINEERS AND CONTRACTORS  
MAIN OFFICE STEWART BUILDING  
BALTIMORE, MD.

March 17th, 1928

Blaw-Knox Company,  
Pittsburgh, Pennsylvania.

Gentlemen:

Att. Mr. Chester H. Lehman, General Sales Manager

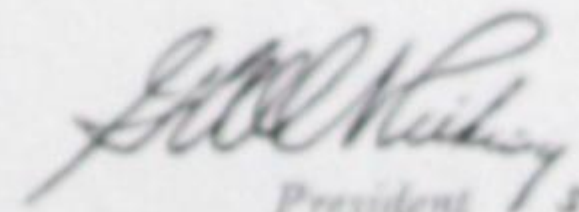
We have been using your Forms for quite a number of years, and are taking this opportunity of telling you how very much satisfied we have been with them on the various jobs on which we have used them.

For a long time we were of the opinion that we could make just as satisfactory steel forms and cheaper than we could rent them from you. We very soon discovered our mistake in this line, and for the past few years, considered nothing but Blaw-Knox Forms for jobs requiring steel form work.

Our experience with your Steel Forms has not only been on bridge work, but also on the Shockoe Creek Improvement Drain for the City of Richmond, Virginia, on which we used 29-ft. Travelling Steel Sewer Forms which gave us the greatest satisfaction.

Yours very truly,

THE WHITING-TURNER CONSTRUCTION CO.



President

G. W. C. Whiting



## *A. Guthrie & Co., Inc.*

CONTRACTORS - ENGINEERS

St. Paul, Minnesota,  
March 5, 1928

Blaw-Knox Co.,  
Pittsburgh,  
Pennsylvania.

Gentlemen:

The six units of forms carrying mixer platforms and distributing systems for the new Cascade Tunnel have now been in use for several months, and I wish to compliment you on the excellent manner in which you developed our ideas in the construction of these units. When we submitted our sketches to you we realized the problem was a difficult one on account of the very small clearances that were available and the necessity of operating muck and concrete trains thru the form units without interruption. We have nothing but praise for the way in which your Company solved this problem.

The forms have been in use now for several months and we have exceeded our highest expectations in the matter of speed of placing the lining. It seems now that we will fully complete the Cascade Tunnel in less than three years from the date of first breaking ground, and if this is accomplished the successful operation of the Blaw form units will be one of the important factors aiding us to attain that result.

You may rest assured that we will submit to you for study our next tough problem in form design.

Yours truly,

*J. C. Baftin*

Vice President

## KOSS CONSTRUCTION CO.

GENERAL CONSTRUCTORS

GENERAL OFFICES AND YARDS  
2315 FIFTH AVENUE

DES MOINES, IOWA

April 10, 1928

The Blaw-Knox Company,  
Pittsburgh,  
Pennsylvania.

Att: Mr. Chester H. Lehman, Gen. Sales Manager.

Gentlemen:

We have used your forms for constructing cylindrical concrete caissons for the Ft. Snelling-Mendota Bridge over the Minnesota River and Valley near Minneapolis, Minnesota. The bridge had 48 cylindrical caissons, each approximately 70 feet high, 14 feet outside and 10 feet inside diameter. The Blaw-Knox inside and outside forms that we used were in 5 foot vertical sections. We found them to be very satisfactory, both economical, quick and easy to place and remove.

Very truly yours,

*W. Decker*

Vice President

## THE ARTHUR A. JOHNSON CORPORATION

Construction Engineers - General Contractors

THIRD STREET AND WEST AVENUE.  
LONG ISLAND CITY, N.Y.

March 16th, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.

Gentlemen:

Attention Mr. Chester H. Lehman, General Sales Manager.

We have recently completed Section 1A, Route 78, New York City subway on Central Park West, N. Y. City, upon which we used Blaw steel forms exclusively. We are further pleased to be able to inform you that these forms were most excellent in every way, and saved us very considerable money, in fact we cannot conceive of any other system of forms or form work by which this comparatively light section and intricate concrete work could be so economically constructed.

We shall shortly be commencing concrete work on another section of the New York City subways, Route 107, Section 11, Manhattan Avenue, Brooklyn, and of course we are again using Blaw-Knox forms.

Very truly yours,

THE ARTHUR H. JOHNSON CORPORATION

*Arthur H. Johnson*

President

FRANK L. COHEN, INC.  
CONTRACTORS  
1232 PRUDENTIAL BUILDING  
BUFFALO, N.Y.

April 2, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.

Gentlemen:

Replying to your inquiry of March 14, 1928.

We used your steel forms on a flood-elimination contract in Buffalo. This contract included nearly fifty thousand cubic yards of concrete. Your forms functioned beautifully at all times, and were so satisfactory that they will probably assure you our business on future work of similar character.

Yours very truly,

FRANK L. COHEN, INC.

*Frank L. Cohen*

Pres.



## THE HOLMES CONSTRUCTION CO.

Highway, Municipal and Railway Contractors



WOOSTER, OHIO

August 29, 1928

Mr. H. B. Loxterman,  
Ass't General Sales Manager,  
Blaw-Knox Co.,  
Pittsburgh, Pa.

Dear Sir:

In reply to your letter of August 21 in regard to the steel forms for the Cuyahoga River Outfall Sewer, Contract No 1, Akron, Ohio, I am glad to inform you that our experience with your forms on this job has been highly satisfactory.

When I went over this job with Mr. Brynoldt, your Chief Engineer, we decided that we would organize the job to take care of nine seventy-five foot sections per week. We have found since putting power on the outside traveler that we can consistently build two sections per day. In fact, in the last fifteen days we have actually completed thirty sections of seventy-five feet each. In constructing, to date, over eight thousand feet of sewer, we have only had one case where we had the slightest trouble with our forms and this caused a delay of less than one hour.

It is rather unusual to organize a job for a certain amount of work and then find the equipment is perfectly adapted to obtain one-third more output. To put it mildly, we are perfectly satisfied with our equipment and have no suggestion, whatsoever, to make in the way of improvement.

I might further state that if we are able to maintain the same rate of progress which we have made in the past month that we will finish the work fully a month ahead of schedule. This in itself, when you remember that we are only working one ten-hour shift and no work on Sundays or Holidays, proves that the forms are functioning absolutely satisfactory.

Yours truly,

THE HOLMES CONSTRUCTION CO.

*A. Stellhorn*

McKENZIE CONSTRUCTION COMPANY  
GENERAL CONTRACTORS  
716 TRAVIS BUILDING  
SAN ANTONIO, TEXAS

March 21, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.

Gentlemen:—

We have your letter of the 14th, asking our opinion of Blaw-Knox Steel Forms.

As your records will show, we now own some of your curb forms, also about 7300 Sq. Ft. of your light wall forms. Both types of forms have been very successful and we have nothing but praise for them when used in the proper manner and on work for which they are adapted.

We have also been impressed with the conservative claims made by Blaw-Knox Engineers in the endeavor to sell steel forms, and so far have been able to equal or better the labor costs claimed by them.

Yours very truly,

McKENZIE CONSTRUCTION CO.

*E. W. Johnson*

## MARK R. HANNA CO.

GENERAL CONTRACTORS

AND  
BUILDERS' SUPPLIES

OFFICE AND PLANT: RYAN ROAD AND NEVADA AVENUE

DETROIT, MICHIGAN

March 22nd, 1928

Blaw-Knox Company,  
Pittsburgh, Pa.

Attention—Mr. Chester H. Lehman

Gentlemen:—

In answer to your letter regarding Blaw-Knox Forms, our experience over the last ten years has been such that we have never been tempted to use any but Blaw-Knox forms.

The Blaw-Knox Tunnel Forms used on our section of Bates street sewer in 1922 and Lonyo and Clark Streets sewer in 1923 were quite satisfactory to us and they also met every requirement of the inspectors.

The Blaw-Knox Forms now in use on our section of the Springwells Water Tunnel are meeting satisfactorily the very rigid requirements of the specifications without an excessive consumption of man-hours in dismantling, cleaning and setting up forms and finishing concrete surface.

Every contractor is constantly striving for labor saving and I believe that the Blaw-Knox Company and their engineers deserve much credit from the contractors for their service.

Your bins, inundators, mechanical proportioning equipment, and water-tight forms, easily moved and set up, yet retaining original shape and form under rough usage, are indispensable to the contractor in meeting the Engineer's requirements for uniform concrete, built true to design. The worry of slump tests, compression tests of cores from finished work and accuracy of shape of structure surface finish is eliminated by the use of your Batcher plant and inundator in conjunction with Blaw-Knox forms.

Sincerely yours,

*Mark R. Hanna*

President  
MARK R. HANNA CO.

## HENRY W. HORST COMPANY

GENERAL CONTRACTORS

ESTABLISHED 1893 — TELEPHONE MAYFAIR 3050

6900 STATE ROAD,  
PHILADELPHIA, PENNA.

March 23, 1928

Blaw-Knox Company,  
Pittsburgh, Pennsylvania.

Gentlemen:

Attention Mr. Chester H. Lehman,  
General Sales Manager.

In answer to your request of recent date, we wish to advise you that we are using 300 feet of your special steel forms designed for the construction of about 14,000 lineal feet of Collecting Sewer now being built for the City of Philadelphia. We have found them easy to handle and they have served us effectively and well in carrying out this particular job.

Very truly yours,

HENRY W. HORST COMPANY

*H. W. Horst*





Offices and 36-Acre Plant of Blaw-Knox Company at Blawnox, Pennsylvania

## Other BLAW-KNOX Products

Descriptive literature covering any products listed below will be mailed upon request.

### STANDARD STEEL BUILDINGS (Sectional)

Portable (permanent) buildings for light manufacturing, storage, field work and for housing men, material and equipment. BLAW-KNOX Standard Steel Buildings meet practically every industrial plant requirement. Fire and weatherproof. Made in standard widths, from 6' to 120' single span. Carried in stock.

### BUCKETS (Clamshell)

There's a Blaw-Knox Bucket for every purpose: Single-Line, Two-Line, Three-Line or Four-Line, for every class of service from lightest rapid rehandling to hardest digging and dredging. Dragline Buckets.

### FORMS (Steel)

Forms for every type of concrete construction. Columns, factories, foundations, houses, reservoirs, roads, streets and sidewalks, sewers, tanks, tunnels, walls, warehouses, etc.

### BATCHERPLANTS

Combination steel bins and automatic measuring batchers for storing and proportioning aggregate for concrete. Ideal central proportioning plants for road building contractors. Blaw-Knox Inundation System for making constant concrete.

### WELDED AND RIVETED PLATE WORK

Forge and hammer-welded equipment for use where high temperatures, high pressures and extremes in expansion and contraction are encountered. Oxyacetylene and electric welding. Riveted steel plate construction and specialties of every description.

### TRACYFIERS

Tracyfiere insure absolutely clean dry steam and reduced cost of maintenance in steam plant operations. Also for use in connection with gas, gasoline plants and compressed air plants. Complete data on request.

### ELECTROFORGED STEEL GRATING

Non-slip Grating giving maximum strength, light and ventilation.

### TRANSMISSION TOWERS AND POLES

Steel towers, poles and A-frames for transmission lines; signal towers and poles, radio towers, catenary supports, electrical distribution, telegraph and telephone poles.

### STEEL PLANT EQUIPMENT

Patented water-cooled equipment for high temperature furnaces. Reversing valves, Sheet and Tin Mill and Strip and Wire Mill Equipment. Forge Furnace coolers.

### ROAD BUILDERS' EQUIPMENT

Road Forms, Steel Bins, Automatic Measuring Batchers, Turntables, Street and Sidewalk Forms, Cement Handling Apparatus. Agitator Truck Bodies, Finishing Machines, Wagon Loaders.

### MANUFACTURING PLANTS

Furnishing and erecting heavy rolling mill buildings, sheet and tin plate plants, machine shops, foundries, factories, crane runways, bridges and all manner of construction requiring highly fabricated steel work.

### REGENERATIVE AIR PREHEATERS

Specially adapted for use with all types of heating furnaces, forging furnaces, soaking pits, glass tanks, etc.; wherever high temperature air under severe working conditions is required, also in connection with gas and stoker fired boilers. Ask for Bulletin 1012 and 1022.

### FLOORGARD AND PAVEGARD

Steel armoring for concrete floors and pavements.

## BLAW-KNOX COMPANY PITTSBURGH, PA.

NEW YORK—342 Madison Ave.

BALTIMORE—Bayard and Warner Sts.

CHICAGO—Peoples Gas Bldg.

BOSTON—605 Statler Bldg.

DETROIT—Lincoln Bldg.

BUFFALO—622 Genesee Bldg.

CLEVELAND—526 Union Bldg.

PHILADELPHIA—906 Widener Bldg.

BIRMINGHAM—Brown Marx Bldg.

EXPORT DIVISION:—MILLIKEN BROS.—BLAW-KNOX CORP., 342 Madison Ave., New York City

LONDON:—BLAW-KNOX LTD., New Oxford House, Hart St. Holborn, W.C.1, London, England

PARIS:—COMPAGNIE FRANCAISE BLAW-KNOX, 1 Rue de Clichy, Paris (1X<sup>e</sup>), Paris, France

MILANO, ITALY:—COMPAGNIA ITALIANA FORME ACCIAIO, 6 Via S. Agnese—6—Milano

*Representatives in all parts of the world*

Form No. 1174



[BLANK PAGE]



CCA



[BLANK PAGE]



CCA

Digitized by



ASSOCIATION  
PRESERVATION  
INTERNATIONAL

BUILDING  
TECHNOLOGY  
HERITAGE  
LIBRARY

[www.apti.org](http://www.apti.org)

From the

CCA

CANADIAN  
ARCHITECTURE  
CENTRE CANADA

[www.cca.org](http://www.cca.org)